APPENDIX J
PIBO and Stream Survey Monitoring Data

Introduction

PIBO monitoring data and Region 6 stream inventory data are presented in this appendix by allotment: Upper Middle Fork, Lower Middle Fork and Slide Creek. PACFISH Riparian Management Objectives, Amendment 29 Desired Future Conditions and NMFS Matrix of Pathways and Indicators criteria are also displayed for applicable habitat elements. The streams by allotment are as follows:

UMF Allotment: Blue Gulch, Mill Cr, Butte Creek, Bennett Creek, Sulphur Creek, Deerhorn Cr, Davis Creek, Placer Gulch, Granite Boulder Creek, Little Boulder Cr, East Trib to Little Boulder Cr, Caribou Cr, Middle Fork JDR, Ragged Creek, Ruby Cr, Little Butte Cr, East Trib to Little Butte Cr, Vincent Creek, Vinegar Creek, Windlass Cr, and Tin Cup.

LMF Allotment: Wray Creek Badger Creek, Beaver Creek, Sunshine Creek Big Boulder Creek, Big Boulder Creek, Big Creek, Deadwood Creek, Mosquito Creek, Deep Creek, NF Elk Creek, Elk Creek Granite Boulder Cr, Lemon Creek, Myrtle Creek, Coyote Creek, Onion Gulch, Swamp Gulch, East Fork Big Creek, Lost Creek and Pizer Creek.

Slide Allotment: Slide Creek, Whiskey Creek, Bear Creek, Camp Creek and Lick Creek.

Upper Middle Fork Allotment

Tables J-1 through J-11 present data for streams in the Upper Middle Fork Allotment.

Table J-1. Summary of R6 Stream Inventory Data for Blue Gulch and Mill Creek, and Fish Habitat Standards for Streams.

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**		**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
					Properly Functioning	**At Risk**	**Not Properly Functioning**
Stream Name	**Blue Gulch Reaches 1-2**	**Mill Cr Reach 1**	-	-	-	-	-
Pasture Name	Upper Vinegar	Austin	-	-	-	-	-
Survey Date	2001 (Aug 17-18)	1993 (July 7)	-	-	-	-	-

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**		**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
					Properly Functioning	**At Risk**	**Not Properly Functioning**
Sample Type	-	-	-	-	-	-	-
6th Field HUC	170702030201	170702030106	-	-	-	-	-
Av Bankfull (B) and/or Wetted (W) Width (feet)	B 7.25 W 5.5	B 9.3 W 7.1	-	-	-	-	-
Av Gradient (%)	10.6	3.0	-	-	-	-	-
Residual Pool Depth (feet)	-	1.1	-	-	-	-	-
Pool Frequency (#/mi)	30.7	31	96[2] 56[3] 47[4] 26[5]	75-132[2] 38-66[3] 30-53[4] 15-26[5]	Meets pool freq & LWD recruitment standards channel width — # pools/mile 5 feet — 184 10 " — 96 15 " — 70 20 " — 56 25 " — 47 50 " — 26	Meets pool freq standards but not LWD recruitment	Does not meet pool freq standards
Pool Quality	No >1m deep pools, max spot temp 61.7F	No >1m deep pools, max spot temp 70.0F	-	-	Pools >1m (3.28ft) deep, good cover, cool water, minimal filling	Few >1m pools or inadequate cover/temp, moderate filling	No >1m pools & inadequate cover/temp, major filling with sediment
Percent Pools	7	15	-	-	-	-	-
Bankfull (B) or Wetted (W) W/D Ratio	B 11.2 W 21.4	B 6.1	<10[6]	<10[6]	<10[7]	10-12[7]	>12[7]
D50 (mm), or Dominant Substrate & Embeddedness	86.5	Gravel. Embeddedness >30% @ 15 of 15 sites	-	Embedded <=20%	Dominant substrate gravel (2-64 mm) or cobble (64-256 mm) (interstitial spaces	Gravel or cobble subdominant, or embeddedness 20-30% if	Bedrock, sand, silt, or small gravel dominant, or embeddedness

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**		**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
					Properly Functioning	**At Risk**	**Not Properly Functioning**
					clear), or embeddedness <20%	dominant	>30% if gravel or cobble dominant
Pct Fines <2 mm in Riffles (R) or Pool Tails (P)	R 4.0	-	-	-	<12% fines[8] in gravel	12-20% fines[8] in gravel	>20% fines[8] in gravel
Percent Stable Banks (CS & FB)	100 (measured on 34.5% of reaches)	91	>80	>90	>90% stable	80-90% stable	< 80% stable
Percent Stable Banks (CS, FB, US)	-	-	-	-	-	-	-
Percent Undercut Banks	-	-	>75	50-75% undercut[9]	-	-	-
Large Wood Frequency (#/mi)[14]	<80[11], lacks recruitment to maintain	0.0[10]	>20[13]	20-70[10] 80-120[11] 100-350[12]	>20[13] and adequate sources for recruitment	>20 but lacks recruitment to maintain	<20 and lacks recruitment
Percent Shade/Canopy Closure	-	40	-	40-55[15] 50-65[16] 60-75[17] 80[18]	-	-	-
Greenline Wetland Rating	-	-	-	-	-	-	-
Greenline Woody Cover	-	-	-	-	-	-	-
Physical Man-made Barriers[19]	Barrier Culvert at 618 road crossing, approx. ¼ mile of habitat upstream	Partial culvert barrier at Hwy 7, water diversion dewatering stream at start of reach 1	-	-	Any in watershed allow passage @ all flows	Any don't allow passage @ base flows	Any don't allow passage @ range of flows
Off-channel Habitat & Refugia	Side channels on <1% of reaches	7 side channels	-	-	Low energy backwaters & side channels	Some backwaters & high energy side	Few or no backwaters

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**		**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
					Properly Functioning	**At Risk**	**Not Properly Functioning**
						channels	

Notes: **1)** All PIBO data units converted from metric to English except for mm measurements; **2)** Channels of <10 feet in width; **3)** Channels of >10 to 20 feet in width; **4)** Channels of >20 to 25 feet in width; **5)** Channels of >25 to 50 feet in width; **6)** Criteria is for wetted W/D ratio; **7)** Criteria is for bankfull W/D ratio; **8)** Fines defined as <0.85mm in gravel; **9)** In non-forested systems with 2% or less gradient; **10)** In Ponderosa pine ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **11)** In mixed conifer ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **12)** In Lodgepole pine ecosystems (at least 6 inches in diameter and 10% > 12 inches in diameter; and at least 18 feet long or 1.5 times bankfull width); **13)** LWD defined as >12 inch diameter and > 35 ft length; **14)** Stream surveys conducted in 1995 and earlier **a)** included not only LW material within the bankfull channel, but also leaning trees that have the potential to fall into the stream, and **b)** included a "Brush" LWD category that is not considered functional LWD as per Amendment 29 DFCs and the MPI unless in Lodgepole Pine ecosystems. Stream surveys conducted in 1996 and later **a)** only included trees actually within the bankfull channel interacting with stream flow during bankfull conditions, and **b)** included a "Small" LWD category that is not considered functional LWD as described above; **15)** In Ponderosa pine ecosystems; **16)** In mixed conifer ecosystems; **17)** In Lodgepole pine ecosystems; **18)** In hardwood/meadow complexes; **19)** Culvert barrier data from MNF Culvert Assessment GIS layer.

Table J-2. Summary of R6 Stream Inventory Data for Butte, Bennett, and Sulphur Creeks, and Fish Habitat Standards for Streams.

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**			**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
						Properly Functioning	**At Risk**	**Not Properly Functioning**
Stream Name	**Butte Creek Reaches 1-3**	**Bennett Creek Reach 1**	**Sulphur Creek Reach 1**	-	-	-	-	-
Pasture Name	Butte	Butte	Butte	-	-	-	-	-
Survey Date	1992 (July 13-28)	1992 (July 31-Aug 3)	1992 (July 24-27)	-	-	-	-	-
Sample Type	**-**	**-**	**-**	-	-	-	-	-
6th Field HUC	170702030203	“”	“”	-	-	-	-	-
Av Bankfull (B) and/or Wetted (W) Width (feet)	B 12.7 W 6.6	B 6.6 W 3.5	B 5.5 W 3.1	-	-	-	-	-
Av Gradient (%)	11	13	12	-	-	-	-	-
Residual Pool Depth (feet)	.93	0.6	0.5	-	-	-	-	-
Pool Frequency (#/mi)	30.4	77.2	88.5	96[2] 56[3] 47[4] 26[5]	75-132[2] 38-66[3] 30-53[4] 15-26[5]	Meets pool freq & LWD recruitment standards channel width / # pools/mile 5 feet / 184 10 " / 96 15 " / 70 20 " / 56 25 " / 47 50 " / 26	Meets pool freq standards but not LWD recruitment	Does not meet pool freq standards
Pool Quality	No >1m deep pools, max spot temp 57.2F	No data sheets, max spot temp 62.6F	No >1m deep pools, max spot temp 64.4F	-	-	Pools >1m (3.28ft) deep, good cover, cool water, minimal filling	Few >1m pools or inadequate cover/temp, moderate filling	No >1m pools & inadequate cover/temp, major filling with sediment

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**			**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
						Properly Functioning	**At Risk**	**Not Properly Functioning**
Percent Pools	4.1	4.7	7.5	-	-	-	-	-
Bankfull (B) or Wetted (W) W/D Ratio	B 8.5	B 5.67	B 7.2	<10[6]	<10[6]	<10[7]	10-12[7]	>12[7]
D50 (mm), or Dominant Substrate & Embeddedness	Cobble/Gravel. 2 of 3 Reaches > 35% Embedded.	Gravel. Not > 35% Embedded.	Gravel. Not > 35% Embedded.	-	Embedded <=20%	Dominant substrate gravel (2-64 mm) or cobble (64-256 mm) (interstitial spaces clear), or embeddedness <20%	Gravel or cobble subdominant, or embeddedness 20-30% if dominant	Bedrock, sand, silt, or small gravel dominant, or embeddedness >30% if gravel or cobble dominant
Pct Fines <2 mm in Riffles (R) or Pool Tails (P)	-	-	-	-	-	<12% fines[8] in gravel	12-20% fines[8] in gravel	>20% fines[8] in gravel
Percent Stable Banks (CS & FB)	89.3	93	94	>80	>90	>90% stable	80-90% stable	< 80% stable
Percent Stable Banks (CS, FB, US)	**-**	**-**	**-**	-	-	-	-	-
Percent Undercut Banks	**-**	**-**	**-**	>75	50-75% undercut[9]	-	-	-
Large Wood Frequency (#/mi)[14]	84.5[11], good recruitment	45.8[11], good recruitment	100.7[11], good recruitment	>20[13]	20-70[10] 80-120[11] 100-350[12]	>20[13] and adequate sources for recruitment	>20 but lacks recruitment to maintain	<20 and lacks recruitment
Percent Shade/Canopy Closure	45	49	31	-	40-55[15] 50-65[16] 60-75[17] 80[18]	-	-	-
Greenline Wetland Rating	-	-	-	-	-	-	-	-

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**			**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
						Properly Functioning	**At Risk**	**Not Properly Functioning**
Greenline Woody Cover	-	-	-	-	-	-	-	-
Physical Man-made Barriers[19]	Three barrier culverts	None	One barrier culvert	-	-	Any in watershed allow passage @ all flows	Any don't allow passage @ base flows	Any don't allow passage @ range of flows
Off-channel Habitat & Refugia	Side channels on 3.0% of reaches	Side channels on 2.1% of reaches	Side channels on 1.6% of reaches	-	-	Low energy backwaters & side channels	Some backwaters & high energy side channels	Few or no backwaters

Notes: **1)** All PIBO data units converted from metric to English except for mm measurements; **2)** Channels of <10 feet in width; **3)** Channels of >10 to 20 feet in width; **4)** Channels of >20 to 25 feet in width; **5)** Channels of >25 to 50 feet in width; **6)** Criteria is for wetted W/D ratio; **7)** Criteria is for bankfull W/D ratio; **8)** Fines defined as <0.85mm in gravel; **9)** In non-forested systems with 2% or less gradient; **10)** In Ponderosa pine ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **11)** In mixed conifer ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **12)** In Lodgepole pine ecosystems (at least 6 inches in diameter and 10% > 12 inches in diameter; and at least 18 feet long or 1.5 times bankfull width); **13)** LWD defined as >12 inch diameter and > 35 ft length; **14)** Stream surveys conducted in 1995 and earlier **a)** included not only LW material within the bankfull channel, but also leaning trees that have the potential to fall into the stream, and **b)** included a "Brush" LWD category that is not considered functional LWD as per Amendment 29 DFCs and the MPI unless in Lodgepole Pine ecosystems. Stream surveys conducted in 1996 and later **a)** only included trees actually within the bankfull channel interacting with stream flow during bankfull conditions, and **b)** included a "Small" LWD category that is not considered functional LWD as described above; **15)** In Ponderosa pine ecosystems; **16)** In mixed conifer ecosystems; **17)** In Lodgepole pine ecosystems; **18)** In hardwood/meadow complexes; **19)** Culvert barrier data from MNF Culvert Assessment GIS layer.

Table J-3. Summary of R6 Stream Inventory Data for Deerhorn Creek, Davis Creek and Placer Gulch, and Fish Habitat Standards for Streams.

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**			**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
						Properly Functioning	**At Risk**	**Not Properly Functioning**
Stream Name	**Deerhorn Cr Reaches 1-3**	**Davis Creek Reaches 1-2**	**Placer Gulch Reaches 1-2**	-	-	-	-	-
Pasture Name	Deerhorn	Deerhorn	Deerhorn	-	-	-	-	-
Survey Date	1993 (June 26-30)	2008 (July 15-17)	2008 (July 21-24)	-	-	-	-	-
Sample Type	-	**-**	**-**	-	-	-	-	-
6th Field HUC	170702030202	170702030201	170702030201	-	-	-	-	-
Av Bankfull (B) and/or Wetted (W) Width (feet)	B 12.1 W 6.2	B 12.1 W 8.3	B 10.1 W 6.6	-	-	-	-	-
Av Gradient (%)	5.8	3.8	3.7	-	-	-	-	-
Residual Pool Depth (feet)	0.7	1.3	1.2	-	-	-	-	-
Pool Frequency (#/mi)	40.0	13.7	21.1	96[2] 56[3] 47[4] 26[5]	75-132[2] 38-66[3] 30-53[4] 15-26[5]	Meets pool freq & LWD recruitment standards channel width / # pools/mile 5 feet 184 10 " 96 15 " 70 20 " 56 25 " 47 50 " 26	Meets pool freq standards but not LWD recruitment	Does not meet pool freq standards
Pool Quality	No >1m deep pools, max spot temp 59.0F	No >1m deep pools, max spot temp 66.2F	No >1m deep pools, max spot temp 60.8F	-	-	Pools >1m (3.28ft) deep, good cover, cool water, minimal filling	Few >1m pools or inadequate cover/temp, moderate filling	No >1m pools & inadequate cover/temp, major filling with sediment

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**			**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
						Properly Functioning	**At Risk**	**Not Properly Functioning**
Percent Pools	7.3	6.6	8.4	-	-	-	-	-
Bankfull (B) or Wetted (W) W/D Ratio	B 11.1	B 11.6	B 13.4	<10[6]	<10[6]	<10[7]	10-12[7]	>12[7]
D50 (mm), or Dominant Substrate & Embeddedness	Gravel/Cobble. Embeddedness >30% @ 25 of 26 sites	19.3	21.3	-	Embedded <=20%	Dominant substrate gravel (2-64 mm) or cobble (64-256 mm) (interstitial spaces clear), or embeddedness <20%	Gravel or cobble subdominant, or embeddedness 20-30% if dominant	Bedrock, sand, silt, or small gravel dominant, or embeddedness >30% if gravel or cobble dominant
Pct Fines <2 mm in Riffles (R) or Pool Tails (P)	-	R 4.0	R 6	-	-	<12% fines[8] in gravel	12-20% fines[8] in gravel	>20% fines[8] in gravel
Percent Stable Banks (CS & FB)	83.7	98.8	98.6	>80	>90	>90% stable	80-90% stable	< 80% stable
Percent Stable Banks (CS, FB, US)	**-**	**-**	**-**	-	-	-	-	-
Percent Undercut Banks	**-**	**-**	**-**	>75	50-75% undercut[9]	-	-	-
Large Wood Frequency (#/mi)[14]	64.5[11], fair recruitment	7.3[11]	4.6[10]	>20[13]	20-70[10] 80-120[11] 100-350[12]	>20[13] and adequate sources for recruitment	>20 but lacks recruitment to maintain	<20 and lacks recruitment
Percent Shade/Canopy Closure	38	-	-	-	40-55[15] 50-65[16] 60-75[17] 80[18]	-	-	-
Greenline Wetland Rating	-	-	-	-	-	-	-	-

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**			**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
						Properly Functioning	**At Risk**	**Not Properly Functioning**
Greenline Woody Cover	-	-	-	-	-	-	-	-
Physical Man-made Barriers[19]	None	None	One barrier culvert	-	-	Any in watershed allow passage @ all flows	Any don't allow passage @ base flows	Any don't allow passage @ range of flows
Off-channel Habitat & Refugia	-	Side channels on 4.1% of reaches	Side channels on 0.6% of reaches	-	-	Low energy backwaters & side channels	Some backwaters & high energy side channels	Few or no backwaters

Notes: **1)** All PIBO data units converted from metric to English except for mm measurements; **2)** Channels of <10 feet in width; **3)** Channels of >10 to 20 feet in width; **4)** Channels of >20 to 25 feet in width; **5)** Channels of >25 to 50 feet in width; **6)** Criteria is for wetted W/D ratio; **7)** Criteria is for bankfull W/D ratio; **8)** Fines defined as <0.85mm in gravel; **9)** In non-forested systems with 2% or less gradient; **10)** In Ponderosa pine ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **11)** In mixed conifer ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **12)** In Lodgepole pine ecosystems (at least 6 inches in diameter and 10% > 12 inches in diameter; and at least 18 feet long or 1.5 times bankfull width); **13)** LWD defined as >12 inch diameter and > 35 ft length; **14)** Stream surveys conducted in 1995 and earlier **a)** included not only LW material within the bankfull channel, but also leaning trees that have the potential to fall into the stream, and **b)** included a "Brush" LWD category that is not considered functional LWD as per Amendment 29 DFCs and the MPI unless in Lodgepole Pine ecosystems. Stream surveys conducted in 1996 and later **a)** only included trees actually within the bankfull channel interacting with stream flow during bankfull conditions, and **b)** included a "Small" LWD category that is not considered functional LWD as described above; **15)** In Ponderosa pine ecosystems; **16)** In mixed conifer ecosystems; **17)** In Lodgepole pine ecosystems; **18)** In hardwood/meadow complexes; **19)** Culvert barrier data from MNF Culvert Assessment GIS layer.

Table J-4. Summary of R6 Stream Inventory Data for Granite Boulder Creek and Fish Habitat Standards for Streams.

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**		**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
					Properly Functioning	**At Risk**	**Not Properly Functioning**
Stream Name	**Granite Boulder Creek Reaches 3-4**	**GB Cr Reaches 1-2**	-	-	-	-	-
Pasture Name	Caribou	Caribou	-	-	-	-	-
Survey Date	2001 (July 31 – Aug 6)	1993 (Aug 8 – 10)	-	-	-	-	-
Sample Type	-	-	-	-	-	-	-
6th Field HUC	170702030203	""	-	-	-	-	-
Av Bankfull (B) and/or Wetted (W) Width (feet)	B 18.4 W 12.9	B 18.9 W 15.1	-	-	-	-	-
Av Gradient (%)	6.5	6.5	-	-	-	-	-
Residual Pool Depth (feet)	-	1.5	-	-	-	-	-
Pool Frequency (#/mi)	13.3	32.5	96[2] 56[3] 47[4] 26[5]	75-132[2] 38-66[3] 30-53[4] 15-26[5]	Meets pool freq & LWD recruitment standards channel width / # pools/mile 5 feet / 184 10 " / 96 15 " / 70 20 " / 56 25 " / 47 50 " / 26	Meets pool freq standards but not LWD recruitment	Does not meet pool freq standards
Pool Quality	One >1m deep pool, max spot temp 63.9F	One >1m deep pool, max spot temp 59.0F	-	-	Pools >1m (3.28ft) deep, good cover, cool water, minimal filling	Few >1m pools or inadequate cover/temp, moderate filling	No >1m pools & inadequate cover/temp, major filling with sediment
Percent Pools	5.5	8.8	-	-	-	-	-
Bankfull (B) or	B 14.7	B 9.9	<10[6]	<10[6]	<10[7]	10-12[7]	>12[7]

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**		**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
					Properly Functioning	**At Risk**	**Not Properly Functioning**
Wetted (W) W/D Ratio	W 9.9						
D50 (mm), or Dominant Substrate & Embeddedness	129.8	Cobble. Embeddedness >30% @ 31 of 31 sites	-	Embedded <=20%	Dominant substrate gravel (2-64 mm) or cobble (64-256 mm) (interstitial spaces clear), or embeddedness <20%	Gravel or cobble subdominant, or embeddedness 20-30% if dominant	Bedrock, sand, silt, or small gravel dominant, or embeddedness >30% if gravel or cobble dominant
Pct Fines <2 mm in Riffles (R) or Pool Tails (P)	R 3.0	-	-	-	<12% fines[8] in gravel	12-20% fines[8] in gravel	>20% fines[8] in gravel
Percent Stable Banks (CS & FB)	98 (measured on 23% of reaches)	96	>80	>90	>90% stable	80-90% stable	< 80% stable
Percent Stable Banks (CS, FB, US)	-	-	-	-	-	-	-
Percent Undercut Banks	-	-	>75	50-75% undercut[9]	-	-	-
Large Wood Frequency (#/mi)[14]	55.5[11], good recruitment	45[11], good recruitment	>20[13]	20-70[10] 80-120[11] 100-350[12]	>20[13] and adequate sources for recruitment	>20 but lacks recruitment to maintain	<20 and lacks recruitment
Percent Shade/Canopy Closure	-	36.7	-	40-55[15] 50-65[16] 60-75[17] 80[18]	-	-	-
Greenline Wetland Rating	-	-	-	-	-	-	-
Greenline Woody Cover	-	-	-	-	-	-	-

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**		**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
					Properly Functioning	**At Risk**	**Not Properly Functioning**
Physical Man-made Barriers[19]	One culvert barrier	One culvert barrier	-	-	Any in watershed allow passage @ all flows	Any don't allow passage @ base flows	Any don't allow passage @ range of flows
Off-channel Habitat & Refugia	Side channels on 27% of reaches	-	-	-	Low energy backwaters & side channels	Some backwaters & high energy side channels	Few or no backwaters

Notes: **1)** All PIBO data units converted from metric to English except for mm measurements; **2)** Channels of <10 feet in width; **3)** Channels of >10 to 20 feet in width; **4)** Channels of >20 to 25 feet in width; **5)** Channels of >25 to 50 feet in width; **6)** Criteria is for wetted W/D ratio; **7)** Criteria is for bankfull W/D ratio; **8)** Fines defined as <0.85mm in gravel; **9)** In non-forested systems with 2% or less gradient; **10)** In Ponderosa pine ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **11)** In mixed conifer ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **12)** In Lodgepole pine ecosystems (at least 6 inches in diameter and 10% > 12 inches in diameter; and at least 18 feet long or 1.5 times bankfull width); **13)** LWD defined as >12 inch diameter and > 35 ft length; **14)** Stream surveys conducted in 1995 and earlier **a)** included not only LW material within the bankfull channel, but also leaning trees that have the potential to fall into the stream, and **b)** included a "Brush" LWD category that is not considered functional LWD as per Amendment 29 DFCs and the MPI unless in Lodgepole Pine ecosystems. Stream surveys conducted in 1996 and later **a)** only included trees actually within the bankfull channel interacting with stream flow during bankfull conditions, and **b)** included a "Small" LWD category that is not considered functional LWD as described above; **15)** In Ponderosa pine ecosystems; **16)** In mixed conifer ecosystems; **17)** In Lodgepole pine ecosystems; **18)** In hardwood/meadow complexes; **19)** Culvert barrier data from MNF Culvert Assessment GIS layer.

Table J-5. Summary of R6 Stream Inventory Data for Little Boulder, Eastern Tributary to Little Boulder, and Caribou Creeks, and Fish Habitat Standards for Streams.

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**			**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
						Properly Functioning	**At Risk**	**Not Properly Functioning**
Stream Name	**Little Boulder Cr Reaches 1-2**	**East Trib to Little Boulder Cr Reach 1**	**Caribou Cr Reaches 1-2**	-	-	-	-	-
Pasture Name	Caribou	Caribou	Caribou	-	-	-	-	-
Survey Date	1993 (July 29-Aug 1)	1993 (July 30-Aug 2)	1993 (June 24-25)	-	-	-	-	-
Sample Type	-	-	-	-	-	-	-	-
6th Field HUC	170702030202	170702030202	170702030202	-	-	-	-	-
Av Bankfull (B) and/or Wetted (W) Width (feet)	B 16.5 W 8.3	B 10.0 W 5	B 12.3 W 5.8	-	-	-	-	-
Av Gradient (%)	8.0	8.0	6	-	-	-	-	-
Residual Pool Depth (feet)	1.0	0.6	0.9	-	-	-	-	-
Pool Frequency (#/mi)	25.1	55.0	46.5	96[2] 56[3] 47[4] 26[5]	75-132[2] 38-66[3] 30-53[4] 15-26[5]	Meets pool freq & LWD recruitment standards channel width / # pools/mile 5 feet / 184 10 " / 96 15 " / 70 20 " / 56 25 " / 47 50 " / 26	Meets pool freq standards but not LWD recruitment	Does not meet pool freq standards
Pool Quality	No >1m deep pools, max spot temp 54.0F	One >1m deep pool, max spot temp 48.0F	No >1m deep pools, max spot temp 65.0F			Pools >1m (3.28ft) deep, good cover, cool water, minimal filling	Few >1m pools or inadequate cover/temp, moderate filling	No >1m pools & inadequate cover/temp, major filling with sediment

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**			**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
						Properly Functioning	**At Risk**	**Not Properly Functioning**
Percent Pools	5.6	12.8	7	-	-	-	-	-
Bankfull (B) or Wetted (W) W/D Ratio	B 16.4	B 9.5	B 10.0	<10[6]	<10[6]	<10[7]	10-12[7]	>12[7]
D50 (mm), or Dominant Substrate & Embeddedness	Cobble. Embeddedness >30% @ 35 of 36 sites	Gravel. Embeddedness >30% @ 10 of 11 sites	Gravel. Embeddedness >30% @ 39 of 41 sites	-	Embedded <=20%	Dominant substrate gravel (2-64 mm) or cobble (64-256 mm) (interstitial spaces clear), or embeddedness <20%	Gravel or cobble subdominant, or embeddedness 20-30% if dominant	Bedrock, sand, silt, or small gravel dominant, or embeddedness >30% if gravel or cobble dominant
Pct Fines <2 mm in Riffles (R) or Pool Tails (P)	-	-	-	-	-	<12% fines[8] in gravel	12-20% fines[8] in gravel	>20% fines[8] in gravel
Percent Stable Banks (CS & FB)	88.5	96.0	92	>80	>90	>90% stable	80-90% stable	< 80% stable
Percent Stable Banks (CS, FB, US)	**-**	**-**	**-**	-	-	-	-	-
Percent Undercut Banks	**-**	**-**	**-**	>75	50-75% undercut[9]	-	-	-
Large Wood Frequency (#/mi)[14]	38.7[11]	67.9[11]	31.7[11] Poor Recruitment	>20[13]	20-70[10] 80-120[11] 100-350[12]	>20[13] and adequate sources for recruitment	>20 but lacks recruitment to maintain	<20 and lacks recruitment
Percent Shade/Canopy Closure	26	21	33	-	40-55[15] 50-65[16] 60-75[17] 80[18]	-	-	-
Greenline Wetland Rating	-	-	-	-	-	-	-	-

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**			**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
						Properly Functioning	**At Risk**	**Not Properly Functioning**
Greenline Woody Cover	-	-	-	-	-	-	-	-
Physical Man-made Barriers[19]	Culverts - 1 known barrier and 2 potential barriers	One barrier culvert	One potential barrier culvert	-	-	Any in watershed allow passage @ all flows	Any don't allow passage @ base flows	Any don't allow passage @ range of flows
Off-channel Habitat & Refugia	12 side channels	Numerous side channels	8 Side Channels	-	-	Low energy backwaters & side channels	Some backwaters & high energy side channels	Few or no backwaters

Notes: **1)** All PIBO data units converted from metric to English except for mm measurements; **2)** Channels of <10 feet in width; **3)** Channels of >10 to 20 feet in width; **4)** Channels of >20 to 25 feet in width; **5)** Channels of >25 to 50 feet in width; **6)** Criteria is for wetted W/D ratio; **7)** Criteria is for bankfull W/D ratio; **8)** Fines defined as <0.85mm in gravel; **9)** In non-forested systems with 2% or less gradient; **10)** In Ponderosa pine ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **11)** In mixed conifer ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **12)** In Lodgepole pine ecosystems (at least 6 inches in diameter and 10% > 12 inches in diameter; and at least 18 feet long or 1.5 times bankfull width); **13)** LWD defined as >12 inch diameter and > 35 ft length; **14)** Stream surveys conducted in 1995 and earlier **a)** included not only LW material within the bankfull channel, but also leaning trees that have the potential to fall into the stream, and **b)** included a "Brush" LWD category that is not considered functional LWD as per Amendment 29 DFCs and the MPI unless in Lodgepole Pine ecosystems. Stream surveys conducted in 1996 and later **a)** only included trees actually within the bankfull channel interacting with stream flow during bankfull conditions, and **b)** included a "Small" LWD category that is not considered functional LWD as described above; **15)** In Ponderosa pine ecosystems; **16)** In mixed conifer ecosystems; **17)** In Lodgepole pine ecosystems; **18)** In hardwood/meadow complexes; **19)** Culvert barrier data from MNF Culvert Assessment GIS layer.

Table J-6. Summary of R6 Stream Inventory Data for Middle Fork John Day River and Fish Habitat Standards for Streams.

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**				**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
							Properly Functioning	**At Risk**	**Not Properly Functioning**
Stream Name	**Middle Fork JDR Reaches 9-10**	**Middle Fork JDR Reaches 9-10**	**Middle Fork JDR Reaches 10-12**	**Middle Fork JDR Reach 12**	-	-	-	-	-
Pasture Name	Butte	River	Deerhorn	Tailings	-	-	-	-	-
Survey Date	2008 (July 8-28)	2008 (July 8-28)	2008 (July 8-28)	2008 (July 8-28)	-	-	-	-	-
Sample Type	**-**	-	-	-	-	-	-	-	-
6th Field HUC	170702030202	""	""	""	-	-	-	-	-
Av Bankfull (B) and/or Wetted (W) Width (feet)	B 35.0 W 26.3	B 35.0 W 26.3	B 38.3 W 28.0	B 38.0 W 26.9	-	-	-	-	-
Av Gradient (%)	0.6	0.6	0.8	0.7	-	-	-	-	-
Residual Pool Depth (feet)	1.3	1.3	1.4	1.8	-	-	-	-	-
Pool Frequency (#/mi)	16	16	12.4	15.4	96[2] 56[3] 47[4] 26[5]	75-132[2] 38-66[3] 30-53[4] 15-26[5]	Meets pool freq & LWD recruitment standards channel width / # pools/mile 5 feet 184 10 " 96 15 " 70 20 " 56 25 " 47 50 " 26	Meets pool freq standards but not LWD recruitment	Does not meet pool freq standards
Pool Quality	1.2 >1m deep pools per mile,	1.2 >1m deep	1.9 > 1m deep	2.9 >1m deep	-	-	Pools >1m (3.28ft) deep, good cover, cool	Few >1m pools or inadequate	No >1m pools & inadequate

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**				**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
							Properly Functioning	**At Risk**	**Not Properly Functioning**
	max spot temp 69.8F	pools per mile, max spot temp 69.8F	pools per mile, max spot temp 69.8F	pools per mile, max spot temp 60.8			water, minimal filling	cover/temp, moderate filling	cover/temp, major filling with sediment
Percent Pools	38.1	38.1	36.2	48.5	-	-	-	-	-
Bankfull (B) or Wetted (W) W/D Ratio	B 18.3	B 18.3	B 20.1	B 20.0	<10[6]	<10[6]	<10[7]	10-12[7]	>12[7]
D50 (mm), or Dominant Substrate & Embeddedness	38.5	38.5	32.1	22.6	-	Embedded <=20%	Dominant substrate gravel (2-64 mm) or cobble (64-256 mm) (interstitial spaces clear), or embeddedness <20%	Gravel or cobble subdominant, or embeddedness 20-30% if dominant	Bedrock, sand, silt, or small gravel dominant, or embeddedness >30% if gravel or cobble dominant
Pct Fines <2 mm in Riffles (R) or Pool Tails (P)	R 11.5	R 11.5	R 13.8	R 14.2	-	-	<12% fines[8] in gravel	12-20% fines[8] in gravel	>20% fines[8] in gravel
Percent Stable Banks (CS & FB)	98.0	98.0	99.2	99.2	>80	>90	>90% stable	80-90% stable	< 80% stable
Percent Stable Banks (CS, FB, US)	**-**	**-**	**-**	**-**	-	-	-	-	-
Percent Undercut Banks	1.6	1.6	0.9	0.5	>75	50-75% undercut[9]	-	-	-
Large Wood Frequency (#/mi)[14]	0.5[10]	0.5[10]	2.3[10]	6.3[10]	>20[13]	20-70[10] 80-120[11] 100-350[12]	>20[13] and adequate sources for recruitment	>20 but lacks recruitment to maintain	<20 and lacks recruitment

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**				**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
							Properly Functioning	**At Risk**	**Not Properly Functioning**
Percent Shade/Canopy Closure	16	16	21.6	22	-	40-55[15] 50-65[16] 60-75[17] 80[18]	-	-	-
Greenline Wetland Rating	-	-	-	-	-	-	-	-	-
Greenline Woody Cover	-	-	-	-	-	-	-	-	-
Physical Man-made Barriers[19]	None	None	None	None	-	-	Any in watershed allow passage @ all flows	Any don't allow passage @ base flows	Any don't allow passage @ range of flows
Off-channel Habitat & Refugia	Side channels on 3.6% of reaches	Side channels on 3.6% of reaches	Side channels on 8.9% of reaches	Side channels on 0.0% of reaches	-	-	Low energy backwaters & side channels	Some backwaters & high energy side channels	Few or no backwaters

Notes: **1)** All PIBO data units converted from metric to English except for mm measurements; **2)** Channels of <10 feet in width; **3)** Channels of >10 to 20 feet in width; **4)** Channels of >20 to 25 feet in width; **5)** Channels of >25 to 50 feet in width; **6)** Criteria is for wetted W/D ratio; **7)** Criteria is for bankfull W/D ratio; **8)** Fines defined as <0.85mm in gravel; **9)** In non-forested systems with 2% or less gradient; **10)** In Ponderosa pine ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **11)** In mixed conifer ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **12)** In Lodgepole pine ecosystems (at least 6 inches in diameter and 10% > 12 inches in diameter; and at least 18 feet long or 1.5 times bankfull width); **13)** LWD defined as >12 inch diameter and > 35 ft length; **14)** Stream surveys conducted in 1995 and earlier **a)** included not only LW material within the bankfull channel, but also leaning trees that have the potential to fall into the stream, and **b)** included a "Brush" LWD category that is not considered functional LWD as per Amendment 29 DFCs and the MPI unless in Lodgepole Pine ecosystems. Stream surveys conducted in 1996 and later **a)** only included trees actually within the bankfull channel interacting with stream flow during bankfull conditions, and **b)** included a "Small" LWD category that is not considered functional LWD as described above; **15)** In Ponderosa pine ecosystems; **16)** In mixed conifer ecosystems; **17)** In Lodgepole pine ecosystems; **18)** In hardwood/meadow complexes; **19)** Culvert barrier data from MNF Culvert Assessment GIS layer.

Table J-7. Summary of R6 Stream Inventory Data for Ragged, Ruby, Little Butte, and East Tributary to Little Butte Creeks, and Fish Habitat Standards for Streams.

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**				**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
							Properly Functioning	**At Risk**	**Not Properly Functioning**
Stream Name	**Ragged Creek Reaches 1-2**	**Ruby Cr Reaches 1-3**	**Little Butte Cr Reaches 1-2**	**East Trib to Little Butte Cr Reaches 1-2**	-	-	-	-	-
Pasture Name	Butte	Butte	Butte	Deerhorn	-	-	-	-	-
Survey Date	1992 (July 13-25)	1993 (June 22-27)	1993 (June 25-27)	1993 (June 27-29)	-	-	-	-	-
Sample Type	-	-	**-**	**-**	-	-	-	-	-
6th Field HUC	170702030203	“”	17070203 0202	“”	-	-	-	-	-
Av Bankfull (B) and/or Wetted (W) Width (feet)	B 9.3 W 5.5	B 16.3 W 6.5	B10.5 W 4.7	B 9.1 W 5.3	-	-	-	-	-
Av Gradient (%)	5.5	9	9.0	6.0	-	-	-	-	-
Residual Pool Depth (feet)	0.65	1.0	0.7	0.7	-	-	-	-	-
Pool Frequency (#/mi)	132.2	42.0	24.0	33.0	96[2] 56[3] 47[4] 26[5]	75-132[2] 38-66[3] 30-53[4] 15-26[5]	Meets pool freq & LWD recruitment standards channel width / # pools/mile 5 feet 184 10 " 96 15 " 70 20 " 56 25 " 47 50 " 26	Meets pool freq standards but not LWD recruitment	Does not meet pool freq standards
Pool Quality	No >1m deep	No >1m	No >1m	No >1m	-	-	Pools >1m (3.28ft)	Few >1m pools	No >1m pools &

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**				**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
							Properly Functioning	**At Risk**	**Not Properly Functioning**
	pools Max spot temp 68F	deep pools, max spot temp 55.0F	deep pools, spot temp 65F	deep pools, spot temp 65F			deep, good cover, cool water, minimal filling	or inadequate cover/temp, moderate filling	inadequate cover/temp, major filling with sediment
Percent Pools	18.4	12.7	3.5	8.0	-	-	-	-	-
Bankfull (B) or Wetted (W) W/D Ratio	B 7.38	B 11.38	B 7.14	B 7.3	<10[6]	<10[6]	<10[7]	10-12[7]	>12[7]
D50 (mm), or Dominant Substrate & Embeddedness	Gravel/Sand. > 35% Embedded.	Gravel. Embeddedness >30% @ 45 of 45 sites	Gravel. Embeddedness >30% @ 0 of 19 sites	Gravel. Embeddedness >30% @ 22 of 27 sites	-	Embedded <=20%	Dominant substrate gravel (2-64 mm) or cobble (64-256 mm) (interstitial spaces clear), or embeddedness <20%	Gravel or cobble subdominant, or embeddedness 20-30% if dominant	Bedrock, sand, silt, or small gravel dominant, or embeddedness >30% if gravel or cobble dominant
Pct Fines <2 mm in Riffles (R) or Pool Tails (P)	-	-	-	-	-	-	<12% fines[8] in gravel	12-20% fines[8] in gravel	>20% fines[8] in gravel
Percent Stable Banks (CS & FB)	86.8	94	94	97.5	>80	>90	>90% stable	80-90% stable	< 80% stable
Percent Stable Banks (CS, FB, US)	**-**	-	**-**	**-**	-	-	-	-	-
Percent Undercut Banks	**-**	-	**-**	**-**	>75	50-75% undercut[9]	-	-	-
Large Wood Frequency (#/mi)[14]	26.5[11], fair recruitment	70.5[11]	47.4[11], good recruitment	32.9[11], good recruitment	>20[13]	20-70[10] 80-120[11] 100-350[12]	>20[13] and adequate sources for recruitment	>20 but lacks recruitment to maintain	<20 and lacks recruitment

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**				**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
							Properly Functioning	**At Risk**	**Not Properly Functioning**
Percent Shade/Canopy Closure	57.6	46	43	52	-	40-55[15] 50-65[16] 60-75[17] 80[18]	-	-	-
Greenline Wetland Rating	-	-	-	-	-	-	-	-	-
Greenline Woody Cover	-	-	-	-	-	-	-	-	-
Physical Man-made Barriers[19]	One barrier culvert	One potential barrier culvert	None	None	-	-	Any in watershed allow passage @ all flows	Any don't allow passage @ base flows	Any don't allow passage @ range of flows
Off-channel Habitat & Refugia	Side channels on 4.0% of reaches	5 side channels	One side channel	Numerous side channels	-	-	Low energy backwaters & side channels	Some backwaters & high energy side channels	Few or no backwaters

Notes: **1)** All PIBO data units converted from metric to English except for mm measurements; **2)** Channels of <10 feet in width; **3)** Channels of >10 to 20 feet in width; **4)** Channels of >20 to 25 feet in width; **5)** Channels of >25 to 50 feet in width; **6)** Criteria is for wetted W/D ratio; **7)** Criteria is for bankfull W/D ratio; **8)** Fines defined as <0.85mm in gravel; **9)** In non-forested systems with 2% or less gradient; **10)** In Ponderosa pine ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **11)** In mixed conifer ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **12)** In Lodgepole pine ecosystems (at least 6 inches in diameter and 10% > 12 inches in diameter; and at least 18 feet long or 1.5 times bankfull width); **13)** LWD defined as >12 inch diameter and > 35 ft length; **14)** Stream surveys conducted in 1995 and earlier **a)** included not only LW material within the bankfull channel, but also leaning trees that have the potential to fall into the stream, and **b)** included a "Brush" LWD category that is not considered functional LWD as per Amendment 29 DFCs and the MPI unless in Lodgepole Pine ecosystems. Stream surveys conducted in 1996 and later **a)** only included trees actually within the bankfull channel interacting with stream flow during bankfull conditions, and **b)** included a "Small" LWD category that is not considered functional LWD as described above; **15)** In Ponderosa pine ecosystems; **16)** In mixed conifer ecosystems; **17)** In Lodgepole pine ecosystems; **18)** In hardwood/meadow complexes; **19)** Culvert barrier data from MNF Culvert Assessment GIS layer.

Table J-8. Summary of R6 Stream Inventory Data for Vincent Creek Reach 2 and Reach 3, and Fish Habitat Standards for Streams.

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**		**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
					Properly Functioning	**At Risk**	**Not Properly Functioning**
Stream Name	**Vincent Creek Reach 2**	**Vincent Creek Reach 3**	-	-	-	-	-
Pasture Name	Lower Vinegar	Upper Vinegar	-	-	-	-	-
Survey Date	1992 (July 13-18)	1992 (July 13-18)	-	-	-	-	-
Sample Type	-	-	-	-	-	-	-
6th Field HUC	170702030201	170702030201	-	-	-	-	-
Av Bankfull (B) and/or Wetted (W) Width (feet)	B 9.2 W 5	B 5.4 W 3.1	-	-	-	-	-
Av Gradient (%)	3	17	-	-	-	-	-
Residual Pool Depth (feet)	0.7	0.5	-	-	-	-	-
Pool Frequency (#/mi)	96.6	70.4	96[2] 56[3] 47[4] 26[5]	75-132[2] 38-66[3] 30-53[4] 15-26[5]	Meets pool freq & LWD recruitment standards channel width / # pools/mile 5 feet / 184 10 " / 96 15 " / 70 20 " / 56 25 " / 47 50 " / 26	Meets pool freq standards but not LWD recruitment	Does not meet pool freq standards
Pool Quality	No >1m deep pools, max spot temp 75.2F	No >1m deep pools, max spot temp 62.6F			Pools >1m (3.28ft) deep, good cover, cool water, minimal filling	Few >1m pools or inadequate cover/temp, moderate filling	No >1m pools & inadequate cover/temp, major filling with sediment
Percent Pools	48.0	23.3	-	-	-	-	-

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**		**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
					Properly Functioning	**At Risk**	**Not Properly Functioning**
Bankfull (B) or Wetted (W) W/D Ratio	B 16.8	B 12.4	<10[6]	<10[6]	<10[7]	10-12[7]	>12[7]
D50 (mm), or Dominant Substrate & Embeddedness	Gravel. Not > 35% Embedded.	Gravel. > 35% Embedded.	-	Embedded <=20%	Dominant substrate gravel (2-64 mm) or cobble (64-256 mm) (interstitial spaces clear), or embeddedness <20%	Gravel or cobble subdominant, or embeddedness 20-30% if dominant	Bedrock, sand, silt, or small gravel dominant, or embeddedness >30% if gravel or cobble dominant
Pct Fines <2 mm in Riffles (R) or Pool Tails (P)	-	-	-	-	<12% fines[8] in gravel	12-20% fines[8] in gravel	>20% fines[8] in gravel
Percent Stable Banks (CS & FB)	100	100	>80	>90	>90% stable	80-90% stable	< 80% stable
Percent Stable Banks (CS, FB, US)	**-**	**-**	-	-	-	-	-
Percent Undercut Banks	**-**	**-**	>75	50-75% undercut[9]	-	-	-
Large Wood Frequency (#/mi)[14]	9.7[10], poor recruitment	66.5[10], fair recruitment	>20[13]	20-70[10] 80-120[11] 100-350[12]	>20[13] and adequate sources for recruitment	>20 but lacks recruitment to maintain	<20 and lacks recruitment
Percent Shade/Canopy Closure	45	64	-	40-55[15] 50-65[16] 60-75[17] 80[18]	-	-	-
Greenline Wetland Rating	-	-	-	-	-	-	-

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**		**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
					Properly Functioning	**At Risk**	**Not Properly Functioning**
Greenline Woody Cover	-	-	-	-	-	-	-
Physical Man-made Barriers[19]	One potential culvert barrier	One culvert barrier	-	-	Any in watershed allow passage @ all flows	Any don't allow passage @ base flows	Any don't allow passage @ range of flows
Off-channel Habitat & Refugia	Side channels on 1.5% of reaches	Side channels on 1.1% of reaches	-	-	Low energy backwaters & side channels	Some backwaters & high energy side channels	Few or no backwaters

Notes: **1)** All PIBO data units converted from metric to English except for mm measurements; **2)** Channels of <10 feet in width; **3)** Channels of >10 to 20 feet in width; **4)** Channels of >20 to 25 feet in width; **5)** Channels of >25 to 50 feet in width; **6)** Criteria is for wetted W/D ratio; **7)** Criteria is for bankfull W/D ratio; **8)** Fines defined as <0.85mm in gravel; **9)** In non-forested systems with 2% or less gradient; **10)** In Ponderosa pine ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **11)** In mixed conifer ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **12)** In Lodgepole pine ecosystems (at least 6 inches in diameter and 10% > 12 inches in diameter; and at least 18 feet long or 1.5 times bankfull width); **13)** LWD defined as >12 inch diameter and > 35 ft length; **14)** Stream surveys conducted in 1995 and earlier **a)** included not only LW material within the bankfull channel, but also leaning trees that have the potential to fall into the stream, and **b)** included a "Brush" LWD category that is not considered functional LWD as per Amendment 29 DFCs and the MPI unless in Lodgepole Pine ecosystems. Stream surveys conducted in 1996 and later **a)** only included trees actually within the bankfull channel interacting with stream flow during bankfull conditions, and **b)** included a "Small" LWD category that is not considered functional LWD as described above; **15)** In Ponderosa pine ecosystems; **16)** In mixed conifer ecosystems; **17)** In Lodgepole pine ecosystems; **18)** In hardwood/meadow complexes; **19)** Culvert barrier data from MNF Culvert Assessment GIS layer.

Table J-9. Summary of PIBO Effectiveness Monitoring Data for Vinegar Creek Reach 1 (2001 and 2006) and Fish Habitat Standards for Streams.

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**PIBO Effectiveness Monitoring Data**		**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
					Properly Functioning	**At Risk**	**Not Properly Functioning**
Stream Name	**Vinegar Creek Reach 1**	**Vinegar Creek Reach 1**	-	-	-	-	-
Pasture Name	Lower Vinegar	Lower Vinegar	-	-	-	-	-
Survey Date	2001	2006	-	-	-	-	-
Sample Type	I	I	-	-	-	-	-
6th Field HUC	170702030201	""	-	-	-	-	-
Av Bankfull (B) and/or Wetted (W) Width (feet)	-	-	-	-	-	-	-
Av Gradient (%)	-	-	-	-	-	-	-
Residual Pool Depth (feet)	0.27	0.23	-	-	-	-	-
Pool Frequency (#/mi)	-	-	96[2] 56[3] 47[4] 26[5]	75-132[2] 38-66[3] 30-53[4] 15-26[5]	Meets pool freq & LWD recruitment standards channel width / # pools/mile 5 feet 184 10 " 96 15 " 70 20 " 56 25 " 47 50 " 26	Meets pool freq standards but not LWD recruitment	Does not meet pool freq standards
Pool Quality	-	-	-	-	Pools >1m (3.28ft) deep, good cover, cool water, minimal filling	Few >1m pools or inadequate cover/temp, moderate filling	No >1m pools & inadequate cover/temp, major filling with sediment
Percent Pools	28.1	30.1	-	-	-	-	-

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**PIBO Effectiveness Monitoring Data**		**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
					Properly Functioning	**At Risk**	**Not Properly Functioning**
Bankfull (B) or Wetted (W) W/D Ratio	B 38.4	B 28.7	<10[6]	<10[6]	<10[7]	10-12[7]	>12[7]
D50 (mm), or Dominant Substrate & Embeddedness	50	60	-	Embedded <=20%	Dominant substrate gravel (2-64 mm) or cobble (64-256 mm) (interstitial spaces clear), or embeddedness <20%	Gravel or cobble subdominant, or embeddedness 20-30% if dominant	Bedrock, sand, silt, or small gravel dominant, or embeddedness >30% if gravel or cobble dominant
Pct Fines <2 mm in Riffles (R) or Pool Tails (P)	-	P 4.9	-	-	<12% fines[8] in gravel	12-20% fines[8] in gravel	>20% fines[8] in gravel
Percent Stable Banks (CS & FB)	93	100	>80	>90	>90% stable	80-90% stable	< 80% stable
Percent Stable Banks (CS, FB, US)	-	-	-	-	-	-	-
Percent Undercut Banks	33.3	31.7	>75	50-75% undercut[9]	-	-	-
Large Wood Frequency (#/mi)[14]	-	-	>20[13]	20-70[10] 80-120[11] 100-350[12]	>20[13] and adequate sources for recruitment	>20 but lacks recruitment to maintain	<20 and lacks recruitment
Percent Shade/Canopy Closure	-	-	-	40-55[15] 50-65[16] 60-75[17] 80[18]	-	-	-
Greenline Wetland Rating	-	62	-	-	-	-	-

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	PIBO Effectiveness Monitoring Data		PAC FISH RMO	Amend 29 DFC	NMFS Matrix of Pathways and Indicators Ranges of Criteria		
					Properly Functioning	**At Risk**	**Not Properly Functioning**
Greenline Woody Cover	-	26	-	-	-	-	-
Physical Man-made Barriers[19]	-	-	-	-	Any in watershed allow passage @ all flows	Any don't allow passage @ base flows	Any don't allow passage @ range of flows
Off-channel Habitat & Refugia	-	-	-	-	Low energy backwaters & side channels	Some backwaters & high energy side channels	Few or no backwaters

Notes: **1)** All PIBO data units converted from metric to English except for mm measurements; **2)** Channels of <10 feet in width; **3)** Channels of >10 to 20 feet in width; **4)** Channels of >20 to 25 feet in width; **5)** Channels of >25 to 50 feet in width; **6)** Criteria is for wetted W/D ratio; **7)** Criteria is for bankfull W/D ratio; **8)** Fines defined as <0.85mm in gravel; **9)** In non-forested systems with 2% or less gradient; **10)** In Ponderosa pine ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **11)** In mixed conifer ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **12)** In Lodgepole pine ecosystems (at least 6 inches in diameter and 10% > 12 inches in diameter; and at least 18 feet long or 1.5 times bankfull width); **13)** LWD defined as >12 inch diameter and > 35 ft length; **14)** Stream surveys conducted in 1995 and earlier **a)** included not only LW material within the bankfull channel, but also leaning trees that have the potential to fall into the stream, and **b)** included a "Brush" LWD category that is not considered functional LWD as per Amendment 29 DFCs and the MPI unless in Lodgepole Pine ecosystems. Stream surveys conducted in 1996 and later **a)** only included trees actually within the bankfull channel interacting with stream flow during bankfull conditions, and **b)** included a "Small" LWD category that is not considered functional LWD as described above; **15)** In Ponderosa pine ecosystems; **16)** In mixed conifer ecosystems; **17)** In Lodgepole pine ecosystems; **18)** In hardwood/meadow complexes; **19)** Culvert barrier data from MNF Culvert Assessment GIS layer.

Table J-10. Summary of R6 Stream Inventory Data for Vincent Creek 1991 and 2001, and Fish Habitat Standards for Streams.

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**				**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
							Properly Functioning	**At Risk**	**Not Properly Functioning**
Stream Name	**Vinegar Creek Reaches 1-5**	**Vinegar Creek Reaches 1-10**	**Vinegar Creek Reaches 5-9**	**Vinegar Creek Reaches 10-14**	-	-	-	-	-
Pasture Name	Lower Vinegar	Lower Vinegar	Upper Vinegar	Upper Vinegar	-	-	-	-	-
Survey Date	2001 (Aug 4-16)	1991 (Aug 5-Sept 11)	2001 (Aug 4-16)	1991 (Aug 5-Sept 11)	-	-	-	-	-
Sample Type	-	-	-	-	-	-	-	-	-
6th Field HUC	170702030201	“”	“”	“”	-	-	-	-	-
Av Bankfull (B) and/or Wetted (W) Width (feet)	B 16 W 10.5	B 28.5	B 11.5 W 8.4	B 19.8	-	-	-	-	-
Av Gradient (%)	2.6	3.3	8.6	5.5	-	-	-	-	-
Residual Pool Depth (feet)	-	-	-	-	-	-	-	-	-
Pool Frequency (#/mi)	15.7	-	14.9	-	96[2] 56[3] 47[4] 26[5]	75-132[2] 38-66[3] 30-53[4] 15-26[5]	Meets pool freq & LWD recruitment standards channel width / # pools/mile 5 feet / 184 10 " / 96 15 " / 70 20 " / 56 25 " / 47 50 " / 26	Meets pool freq standards but not LWD recruitment	Does not meet pool freq standards
Pool Quality	No >1m deep pools, max spot	No >1m deep	No >1m deep	No >1m deep	-	-	Pools >1m (3.28ft) deep, good cover, cool	Few >1m pools or inadequate	No >1m pools & inadequate

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**				**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
							Properly Functioning	**At Risk**	**Not Properly Functioning**
	temp 67.4F	pools, max spot temp 70.0F	pools, max spot temp data not avail.	pools, max spot temp 55.0F			water, minimal filling	cover/temp, moderate filling	cover/temp, major filling with sediment
Percent Pools	8.2	-	5.2	-	-	-	-	-	-
Bankfull (B) or Wetted (W) W/D Ratio	B 20 W 10.1	B 15.7	B 14.4 W 7.7	B 11.2	<10[6]	<10[6]	<10[7]	10-12[7]	>12[7]
D50 (mm), or Dominant Substrate & Embeddedness	82.3	-	122.6	-	-	Embedded <=20%	Dominant substrate gravel (2-64 mm) or cobble (64-256 mm) (interstitial spaces clear), or embeddedness <20%	Gravel or cobble subdominant, or embeddedness 20-30% if dominant	Bedrock, sand, silt, or small gravel dominant, or embeddedness >30% if gravel or cobble dominant
Pct Fines <2 mm in Riffles (R) or Pool Tails (P)	R 3.6	-	R 1.8	-	-	-	<12% fines[8] in gravel	12-20% fines[8] in gravel	>20% fines[8] in gravel
Percent Stable Banks (CS & FB)	93 (measured on 6.6% of reaches)	-	91 (measured on 6.2% of reaches)	-	>80	>90	>90% stable	80-90% stable	< 80% stable
Percent Stable Banks (CS, FB, US)	-	-	-	-	-	-	-	-	-
Percent Undercut Banks	-	-	-	-	>75	50-75% undercut[9]	-	-	-
Large Wood Frequency (#/mi)[14]	17.4[11], poor recruitment	-	76.8[11], fair recruitment	-	>20[13]	20-70[10] 80-120[11] 100-350[12]	>20[13] and adequate sources for recruitment	>20 but lacks recruitment to maintain	<20 and lacks recruitment

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**				**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
							Properly Functioning	**At Risk**	**Not Properly Functioning**
Percent Shade/Canopy Closure	-	-	-	-	-	40-55[15] 50-65[16] 60-75[17] 80[18]	-	-	-
Greenline Wetland Rating	-	-	-	-	-	-	-	-	-
Greenline Woody Cover	-	-	-	-	-	-	-	-	-
Physical Man-made Barriers[19]	One potential culvert barrier	One potential culvert barrier	One culvert barrier	One culvert barrier	-	-	Any in watershed allow passage @ all flows	Any don't allow passage @ base flows	Any don't allow passage @ range of flows
Off-channel Habitat & Refugia	Side channels on 8% of reaches	-	Side channels on 6.6% of reaches	-	-	-	Low energy backwaters & side channels	Some backwaters & high energy side channels	Few or no backwaters

Notes: **1)** All PIBO data units converted from metric to English except for mm measurements; **2)** Channels of <10 feet in width; **3)** Channels of >10 to 20 feet in width; **4)** Channels of >20 to 25 feet in width; **5)** Channels of >25 to 50 feet in width; **6)** Criteria is for wetted W/D ratio; **7)** Criteria is for bankfull W/D ratio; **8)** Fines defined as <0.85mm in gravel; **9)** In non-forested systems with 2% or less gradient; **10)** In Ponderosa pine ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **11)** In mixed conifer ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **12)** In Lodgepole pine ecosystems (at least 6 inches in diameter and 10% > 12 inches in diameter; and at least 18 feet long or 1.5 times bankfull width); **13)** LWD defined as >12 inch diameter and > 35 ft length; **14)** Stream surveys conducted in 1995 and earlier **a)** included not only LW material within the bankfull channel, but also leaning trees that have the potential to fall into the stream, and **b)** included a "Brush" LWD category that is not considered functional LWD as per Amendment 29 DFCs and the MPI unless in Lodgepole Pine ecosystems. Stream surveys conducted in 1996 and later **a)** only included trees actually within the bankfull channel interacting with stream flow during bankfull conditions, and **b)** included a "Small" LWD category that is not considered functional LWD as described above; **15)** In Ponderosa pine ecosystems; **16)** In mixed conifer ecosystems; **17)** In Lodgepole pine ecosystems; **18)** In hardwood/meadow complexes; **19)** Culvert barrier data from MNF Culvert Assessment GIS layer.

Table J-11. Summary of R6 Stream Inventory Data for Windlass and Tin Cup Creeks, and Fish Habitat Standards for Streams.

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**			**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
						Properly Functioning	**At Risk**	**Not Properly Functioning**
Stream Name	**Windlass Cr Reach 1**	**Windlass Cr Reach 2**	**Tin Cup Reach 1**	-	-	-	-	-
Pasture Name	Tin Cup Riparian	Caribou	Tin Cup Riparian, Shop	-	-	-	-	-
Survey Date	1993 (June 24-25)	1993 (June 24-25)	2001 (Sept 6)	-	-	-	-	-
Sample Type	-	-	-	-	-	-	-	-
6th Field HUC	170702030202	""	""	-	-	-	-	-
Av Bankfull (B) and/or Wetted (W) Width (feet)	B 8.0 W 4.3	B 7.0 W 5.5	B 3.8 W 2.8	-	-	-	-	-
Av Gradient (%)	8	16	7.0	-	-	-	-	-
Residual Pool Depth (feet)	1.0	1.0	-	-	-	-	-	-
Pool Frequency (#/mi)	43.3	7.7	13.1	96[2] 56[3] 47[4] 26[5]	75-132[2] 38-66[3] 30-53[4] 15-26[5]	Meets pool freq & LWD recruitment standards channel width # pools/mile 5 feet 184 10 " 96 15 " 70 20 " 56 25 " 47 50 " 26	Meets pool freq standards but not LWD recruitment	Does not meet pool freq standards
Pool Quality	No >1m deep pools, max spot temp 54.0F	No >1m deep pools, max spot temp 54.0F	No >1m deep pools, max spot temp 53.6F	-	-	Pools >1m (3.28ft) deep, good cover, cool water, minimal filling	Few >1m pools or inadequate cover/temp, moderate filling	No >1m pools & inadequate cover/temp, major filling with sediment
Percent Pools	6.0	4.1	1	-	-	-	-	-

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**			**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
						Properly Functioning	**At Risk**	**Not Properly Functioning**
Bankfull (B) or Wetted (W) W/D Ratio	B 5.0	B 5.6	B 7.6 W 9.3	<10[6]	<10[6]	<10[7]	10-12[7]	>12[7]
D50 (mm), or Dominant Substrate & Embeddedness	Gravel. Embeddedness >30% @ 2 of 23 sites	Gravel. Embeddedness >30% @ 1 of 3 sites	1.7	-	Embedded <=20%	Dominant substrate gravel (2-64 mm) or cobble (64-256 mm) (interstitial spaces clear), or embeddedness <20%	Gravel or cobble subdominant, or embeddedness 20-30% if dominant	Bedrock, sand, silt, or small gravel dominant, or embeddedness >30% if gravel or cobble dominant
Pct Fines <2 mm in Riffles (R) or Pool Tails (P)	-	-	R 67.0	-	-	<12% fines[8] in gravel	12-20% fines[8] in gravel	>20% fines[8] in gravel
Percent Stable Banks (CS & FB)	94	99	100 (measured on 29% of reaches)	>80	>90	>90% stable	80-90% stable	< 80% stable
Percent Stable Banks (CS, FB, US)	-	-	-	-	-	-	-	-
Percent Undercut Banks	-	-	-	>75	50-75% undercut[9]	-	-	-
Large Wood Frequency (#/mi)[14]	12.7[11]	96.3[11]	3[10], good recruitment	>20[13]	20-70[10] 80-120[11] 100-350[12]	>20[13] and adequate sources for recruitment	>20 but lacks recruitment to maintain	<20 and lacks recruitment
Percent Shade/Canopy Closure	50	43	-	-	40-55[15] 50-65[16] 60-75[17] 80[18]	-	-	-
Greenline Wetland Rating	-	-	-	-	-	-	-	-
Greenline Woody Cover	-	-	-	-	-	-	-	-

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	R6 Level II Stream Survey Data			PAC FISH RMO	Amend 29 DFC	NMFS Matrix of Pathways and Indicators Ranges of Criteria		
						Properly Functioning	**At Risk**	**Not Properly Functioning**
Physical Man-made Barriers[19]	One potential culvert barrier	One culvert barrier	None	-	-	Any in watershed allow passage @ all flows	Any don't allow passage @ base flows	Any don't allow passage @ range of flows
Off-channel Habitat & Refugia	2 side channels	1 side channel	Side channels on 0% of reaches	-	-	Low energy backwaters & side channels	Some backwaters & high energy side channels	Few or no backwaters

Notes: **1)** All PIBO data units converted from metric to English except for mm measurements; **2)** Channels of <10 feet in width; **3)** Channels of >10 to 20 feet in width; **4)** Channels of >20 to 25 feet in width; **5)** Channels of >25 to 50 feet in width; **6)** Criteria is for wetted W/D ratio; **7)** Criteria is for bankfull W/D ratio; **8)** Fines defined as <0.85mm in gravel; **9)** In non-forested systems with 2% or less gradient; **10)** In Ponderosa pine ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **11)** In mixed conifer ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **12)** In Lodgepole pine ecosystems (at least 6 inches in diameter and 10% > 12 inches in diameter; and at least 18 feet long or 1.5 times bankfull width); **13)** LWD defined as >12 inch diameter and > 35 ft length; **14)** Stream surveys conducted in 1995 and earlier **a)** included not only LW material within the bankfull channel, but also leaning trees that have the potential to fall into the stream, and **b)** included a "Brush" LWD category that is not considered functional LWD as per Amendment 29 DFCs and the MPI unless in Lodgepole Pine ecosystems. Stream surveys conducted in 1996 and later **a)** only included trees actually within the bankfull channel interacting with stream flow during bankfull conditions, and **b)** included a "Small" LWD category that is not considered functional LWD as described above; **15)** In Ponderosa pine ecosystems; **16)** In mixed conifer ecosystems; **17)** In Lodgepole pine ecosystems; **18)** In hardwood/meadow complexes; **19)** Culvert barrier data from MNF Culvert Assessment GIS layer.

Lower Middle Fork Allotment

Tables J-12 through J-21 present data for streams in the Lower Middle Fork Allotment.

Table J-12. Summary of R6 Stream Inventory Data for Badger and Wray Creeks, and Fish Habitat Standards for Streams.

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	R6 Level II Stream Survey Data				PAC FISH RMO	Amend 29 DFC	NMFS Matrix of Pathways and Indicators Ranges of Criteria		
							Properly Functioning	**At Risk**	**Not Properly Functioning**
Stream Name	**Badger Creek Reaches 1-2**	**Badger Creek Reaches**	**Wray Creek Reaches**	**Wray Creek Reaches**	-	-	-	-	-

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**				**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
							Properly Functioning	**At Risk**	**Not Properly Functioning**
		1-2	**1-2**	**1-2**					
Pasture Name	Susanville	Susanville	Susanville	Susanville	-	-	-	-	-
Survey Date	2001 (Aug 21-27)	1992 (July 29-Aug 5)	2001 (Aug 2-6)	1992 (July 28-Aug 6)	-	-	-	-	-
Sample Type	-	-	-	-	-	-	-	-	-
6th Field HUC	170702030204	""	""	""	-	-	-	-	-
Av Bankfull (B) and/or Wetted (W) Width (feet)	B 13.0 W 8.4	B 14.1 W 8.9	B 7.9 W 6.7	B W 7.3	-	-	-	-	-
Av Gradient (%)	7	4	8	6.5	-	-	-	-	-
Residual Pool Depth (feet)	-	1.1	N/C	0.9	-	-	-	-	-
Pool Frequency (#/mi)	10.5	77.1	14.1	53.8	96[2] 56[3] 47[4] 26[5]	75-132[2] 38-66[3] 30-53[4] 15-26[5]	Meets pool freq & LWD recruitment standards channel width # pools/mile 5 feet 184 10 " 96 15 " 70 20 " 56 25 " 47 50 " 26	Meets pool freq standards but not LWD recruitment	Does not meet pool freq standards
Pool Quality	No >1m deep pools, max spot temp 71.6F	One >1m deep pool, max spot temp 57.2F	No >1m deep pools, max spot temp 66.2F	No >1m deep pools, max spot temp 57.2F			Pools >1m (3.28ft) deep, good cover, cool water, minimal filling	Few >1m pools or inadequate cover/temp, moderate filling	No >1m pools & inadequate cover/temp, major filling with sediment
Percent Pools	2.5	11.8	3	13.7	-	-	-	-	-

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**				**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
							Properly Functioning	**At Risk**	**Not Properly Functioning**
Bankfull (B) or Wetted (W) W/D Ratio	B 14.8 W 11.5	B 11	B 12.8 W 10.1	B 15.2	<10[6]	<10[6]	<10[7]	10-12[7]	>12[7]
D50 (mm), or Dominant Substrate & Embeddedness	97.1, Embedded	Cobble, Embeddedness >35%	47.5, Embedded	Gravel. Embeddedness >35%	-	Embedded <=20%	Dominant substrate gravel (2-64 mm) or cobble (64-256 mm) (interstitial spaces clear), or embeddedness <20%	Gravel or cobble subdominant, or embeddedness 20-30% if dominant	Bedrock, sand, silt, or small gravel dominant, or embeddedness >30% if gravel or cobble dominant
Pct Fines <2 mm in Riffles (R) or Pool Tails (P)	R 8	-	R 24.5	-	-	-	<12% fines[8] in gravel	12-20% fines[8] in gravel	>20% fines[8] in gravel
Percent Stable Banks (CS & FB)	55% measured on 35% of reaches, 1998 debris torrents	92.5	86.5% measured on 38% of reaches	99.5	>80	>90	>90% stable	80-90% stable	< 80% stable
Percent Stable Banks (CS, FB, US)	-	-	-	-	-	-	-	-	-
Percent Undercut Banks	-	-	-	-	>75	50-75% undercut[9]	-	-	-
Large Wood Frequency (#/mi)[14]	68.5[11], Good Recruitment	139.8[11]	83[11], Very Good Recruitment	100[11], fair recruitment	>20[13]	20-70[10] 80-120[11] 100-350[12]	>20[13] and adequate sources for recruitment	>20 but lacks recruitment to maintain	<20 and lacks recruitment
Percent Shade/Canopy Closure	Burned in 1996, no overstory shading, minimal	65	Burned in 1996, largely void of shading	75.5	-	40-55[15] 50-65[16] 60-75[17] 80[18]	-	-	-

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**				**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
							Properly Functioning	**At Risk**	**Not Properly Functioning**
	understory		vegetation						
Greenline Wetland Rating	-	-	-	-	-	-	-	-	-
Greenline Woody Cover	-	-	-	-	-	-	-	-	-
Physical Man-made Barriers[19]	None	None	One barrier (log weir backwatering culvert)	One barrier (log weir backwatering culvert)	-	-	Any in watershed allow passage @ all flows	Any don't allow passage @ base flows	Any don't allow passage @ range of flows
Off-channel Habitat & Refugia	Side channels on 3% of reaches, 2 total	Side channels on 10.5% of reaches	Side channels on 1.5% of reaches, 4 total	Side channels on 3.4% of reaches	-	-	Low energy backwaters & side channels	Some backwaters & high energy side channels	Few or no backwaters

Notes: **1)** All PIBO data units converted from metric to English except for mm measurements; **2)** Channels of <10 feet in width; **3)** Channels of >10 to 20 feet in width; **4)** Channels of >20 to 25 feet in width; **5)** Channels of >25 to 50 feet in width; **6)** Criteria is for wetted W/D ratio; **7)** Criteria is for bankfull W/D ratio; **8)** Fines defined as <0.85mm in gravel; **9)** In non-forested systems with 2% or less gradient; **10)** In Ponderosa pine ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **11)** In mixed conifer ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **12)** In Lodgepole pine ecosystems (at least 6 inches in diameter and 10% > 12 inches in diameter; and at least 18 feet long or 1.5 times bankfull width); **13)** LWD defined as >12 inch diameter and > 35 ft length; **14)** Stream surveys conducted in 1995 and earlier **a)** included not only LW material within the bankfull channel, but also leaning trees that have the potential to fall into the stream, and **b)** included a "Brush" LWD category that is not considered functional LWD as per Amendment 29 DFCs and the MPI unless in Lodgepole Pine ecosystems. Stream surveys conducted in 1996 and later **a)** only included trees actually within the bankfull channel interacting with stream flow during bankfull conditions, and **b)** included a "Small" LWD category that is not considered functional LWD as described above; **15)** In Ponderosa pine ecosystems; **16)** In mixed conifer ecosystems; **17)** In Lodgepole pine ecosystems; **18)** In hardwood/meadow complexes; **19)** Culvert barrier data from MNF Culvert Assessment GIS layer.

Table J-13. Summary of R6 Stream Inventory Data for Beaver and Sunshine Creeks, and Fish Habitat Standards for Streams.

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**			**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
						Properly Functioning	**At Risk**	**Not Properly Functioning**
Stream Name	**Beaver Creek Reaches 1-3**	**Beaver Creek Reach 3**	**Sunshine Creek Reaches 1-2**	-	-	-	-	-
Pasture Name	Granite Boulder	Susanville	Sunshine	-	-	-	-	-
Survey Date	1994 (Aug 18-25)	1994 (Aug 18-25)	1993 (July 2-4)	-	-	-	-	-
Sample Type	-	-	-	-	-	-	-	-
6th Field HUC	170702030203	"	170702030208	-	-	-	-	-
Av Bankfull (B) and/or Wetted (W) Width (feet)	B 7.2 W 5.6	B 6.3 W 5.1	B 6.5 W 4.9	-	-	-	-	-
Av Gradient (%)	7	11	8	-	-	-	-	-
Residual Pool Depth (feet)	0.8	0.8	0.8	-	-	-	-	-
Pool Frequency (#/mi)	56.0	55.0	40.2	96[2] 56[3] 47[4] 26[5]	75-132[2] 38-66[3] 30-53[4] 15-26[5]	Meets pool freq & LWD recruitment standards channel width / # pools/mile 5 feet 184 10 " 96 15 " 70 20 " 56 25 " 47 50 " 26	Meets pool freq standards but not LWD recruitment	Does not meet pool freq standards
Pool Quality	No >1m deep pools, max spot temp 64F	No >1m deep pools, max spot temp 63F	No >1m deep pools, max spot temp 54.0F	-	-	Pools >1m (3.28ft) deep, good cover, cool water, minimal filling	Few >1m pools or inadequate cover/temp, moderate filling	No >1m pools & inadequate cover/temp, major filling with sediment

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**			**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
						Properly Functioning	**At Risk**	**Not Properly Functioning**
Percent Pools	12.6	11.6	11.3	-	-	-	-	-
Bankfull (B) or Wetted (W) W/D Ratio	B 10.7	B 9.6	B 5.7	<10[6]	<10[6]	<10[7]	10-12[7]	>12[7]
D50 (mm), or Dominant Substrate & Embeddedness	Cobble. Embeddedness >30% @ 2 of 3 reaches	Cobble. Embeddedness >30% @ 1 of 1 reach	Cobble/Gravel. Embeddedness >30% @ 32 of 32 sites	-	Embedded <=20%	Dominant substrate gravel (2-64 mm) or cobble (64-256 mm) (interstitial spaces clear), or embeddedness <20%	Gravel or cobble subdominant, or embeddedness 20-30% if dominant	Bedrock, sand, silt, or small gravel dominant, or embeddedness >30% if gravel or cobble dominant
Pct Fines <2 mm in Riffles (R) or Pool Tails (P)	-	-	-	-		<12% fines[8] in gravel	12-20% fines[8] in gravel	>20% fines[8] in gravel
Percent Stable Banks (CS & FB)	-	-	88	>80	>90	>90% stable	80-90% stable	< 80% stable
Percent Stable Banks (CS, FB, US)	-	**-**	**-**	-	-	-	-	-
Percent Undercut Banks	-	**-**	**-**	>75	50-75% undercut[9]	-	-	-
Large Wood Frequency (#/mi)[14]	38.7[11]	72.1[11]	39.9[11]	>20[13]	20-70[10] 80-120[11] 100-350[12]	>20[13] and adequate sources for recruitment	>20 but lacks recruitment to maintain	<20 and lacks recruitment
Percent Shade/Canopy Closure	-	-	48	-	40-55[15] 50-65[16] 60-75[17] 80[18]	-	-	-
Greenline Wetland Rating	-	-	-	-	-	-	-	-

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**			**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
						Properly Functioning	**At Risk**	**Not Properly Functioning**
Greenline Woody Cover	-	-	-	-	-	-	-	-
Physical Man-made Barriers[19]	None	None	None	-	-	Any in watershed allow passage @ all flows	Any don't allow passage @ base flows	Any don't allow passage @ range of flows
Off-channel Habitat & Refugia	-	-	7 side channels	-	-	Low energy backwaters & side channels	Some backwaters & high energy side channels	Few or no backwaters

Notes: **1)** All PIBO data units converted from metric to English except for mm measurements; **2)** Channels of <10 feet in width; **3)** Channels of >10 to 20 feet in width; **4)** Channels of >20 to 25 feet in width; **5)** Channels of >25 to 50 feet in width; **6)** Criteria is for wetted W/D ratio; **7)** Criteria is for bankfull W/D ratio; **8)** Fines defined as <0.85mm in gravel; **9)** In non-forested systems with 2% or less gradient; **10)** In Ponderosa pine ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **11)** In mixed conifer ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **12)** In Lodgepole pine ecosystems (at least 6 inches in diameter and 10% > 12 inches in diameter; and at least 18 feet long or 1.5 times bankfull width); **13)** LWD defined as >12 inch diameter and > 35 ft length; **14)** Stream surveys conducted in 1995 and earlier **a)** included not only LW material within the bankfull channel, but also leaning trees that have the potential to fall into the stream, and **b)** included a "Brush" LWD category that is not considered functional LWD as per Amendment 29 DFCs and the MPI unless in Lodgepole Pine ecosystems. Stream surveys conducted in 1996 and later **a)** only included trees actually within the bankfull channel interacting with stream flow during bankfull conditions, and **b)** included a "Small" LWD category that is not considered functional LWD as described above; **15)** In Ponderosa pine ecosystems; **16)** In mixed conifer ecosystems; **17)** In Lodgepole pine ecosystems; **18)** In hardwood/meadow complexes; **19)** Culvert barrier data from MNF Culvert Assessment GIS layer.

Table J-14. Summary of R6 Stream Inventory Data and PIBO Effectivenesss Monitoring Data for Big Boulder Creek, and Fish Habitat Standards for Streams.

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**		**PIBO Data**	**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
						Properly Functioning	**At Risk**	**Not Properly Functioning**
Stream Name	**Big Boulder Creek Reaches 1-4**	**Big Boulder Creek Reach 1 only (for comparison w/ PIBO)**	**Big Boulder Creek Reach 1**	-	-	-	-	-
Pasture Name	Susanville	Susanville	Susanville	-	-	-	-	-
Survey Date	1992 (July 13-24)	1992 (July 13-24)	2006	-	-	-	-	-
Sample Type	-	-	I	-	-	-	-	-
6th Field HUC	170702030204	""	""	-	-	-	-	-
Av Bankfull (B) and/or Wetted (W) Width (feet)	B 21.1 W 13.7	-	-	-	-	-	-	-
Av Gradient (%)	5.8	-	-	-	-	-	-	-
Residual Pool Depth (feet)	1.4	1.7	0.69	-	-	-	-	-
Pool Frequency (#/mi)	38.0	-	-	96[2] 56[3] 47[4] 26[5]	75-132[2] 38-66[3] 30-53[4] 15-26[5]	Meets pool freq & LWD recruitment standards channel width / # pools/mile 5 feet 184 10 " 96 15 " 70 20 " 56 25 " 47 50 " 26	Meets pool freq standards but not LWD recruitment	Does not meet pool freq standards
Pool Quality	Four >1m deep pools, max spot temp	-	-	-		Pools >1m (3.28ft) deep, good cover, cool water, minimal filling	Few >1m pools or inadequate cover/temp,	No >1m pools & inadequate cover/temp, major

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**		**PIBO Data**	**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
						Properly Functioning	**At Risk**	**Not Properly Functioning**
	66.2F						moderate filling	filling with sediment
Percent Pools	15.8	12.3	26.9	-	-	-	-	-
Bankfull (B) or Wetted (W) W/D Ratio	B 13.6	B 15.5	B 28	<10[6]	<10[6]	<10[7]	10-12[7]	>12[7]
D50 (mm), or Dominant Substrate & Embeddedness	Cobble, Embeddedness >35%	Cobble, Embeddedness >35%	60	-	Embedded <=20%	Dominant substrate gravel (2-64 mm) or cobble (64-256 mm) (interstitial spaces clear), or embeddedness <20%	Gravel or cobble subdominant, or embeddedness 20-30% if dominant	Bedrock, sand, silt, or small gravel dominant, or embeddedness >30% if gravel or cobble dominant
Pct Fines <2 mm in Riffles (R) or Pool Tails (P)	-	-	P 9.4	-		<12% fines[8] in gravel	12-20% fines[8] in gravel	>20% fines[8] in gravel
Percent Stable Banks (CS & FB)	94.5	91	100	>80	>90	>90% stable	80-90% stable	< 80% stable
Percent Stable Banks (CS, FB, US)	-	-	-	-	-	-	-	-
Percent Undercut Banks	-	-	9.8	>75	50-75% undercut[9]	-	-	-
Large Wood Frequency (#/mi)[14]	61.9[11], Fair Recruitment	-	-	>20[13]	20-70[10] 80-120[11] 100-350[12]	>20[13] and adequate sources for recruitment	>20 but lacks recruitment to maintain	<20 and lacks recruitment
Percent Shade/Canopy Closure	58.8	-	-	-	40-55[15] 50-65[16] 60-75[17] 80[18]	-	-	-

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**		**PIBO Data**	**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
						Properly Functioning	**At Risk**	**Not Properly Functioning**
Greenline Wetland Rating	-	-	50	-	-	-	-	-
Greenline Woody Cover	-	-	12	-	-	-	-	-
Physical Man-made Barriers[19]	2 culvert barriers	-	-	-	-	Any in watershed allow passage @ all flows	Any don't allow passage @ base flows	Any don't allow passage @ range of flows
Off-channel Habitat & Refugia	Side channels on 6.6% of reaches	-	-	-	-	Low energy backwaters & side channels	Some backwaters & high energy side channels	Few or no backwaters

Notes: **1)** All PIBO data units converted from metric to English except for mm measurements; **2)** Channels of <10 feet in width; **3)** Channels of >10 to 20 feet in width; **4)** Channels of >20 to 25 feet in width; **5)** Channels of >25 to 50 feet in width; **6)** Criteria is for wetted W/D ratio; **7)** Criteria is for bankfull W/D ratio; **8)** Fines defined as <0.85mm in gravel; **9)** In non-forested systems with 2% or less gradient; **10)** In Ponderosa pine ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **11)** In mixed conifer ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **12)** In Lodgepole pine ecosystems (at least 6 inches in diameter and 10% > 12 inches in diameter; and at least 18 feet long or 1.5 times bankfull width); **13)** LWD defined as >12 inch diameter and > 35 ft length; **14)** Stream surveys conducted in 1995 and earlier **a)** included not only LW material within the bankfull channel, but also leaning trees that have the potential to fall into the stream, and **b)** included a "Brush" LWD category that is not considered functional LWD as per Amendment 29 DFCs and the MPI unless in Lodgepole Pine ecosystems. Stream surveys conducted in 1996 and later **a)** only included trees actually within the bankfull channel interacting with stream flow during bankfull conditions, and **b)** included a "Small" LWD category that is not considered functional LWD as described above; **15)** In Ponderosa pine ecosystems; **16)** In mixed conifer ecosystems; **17)** In Lodgepole pine ecosystems; **18)** In hardwood/meadow complexes; **19)** Culvert barrier data from MNF Culvert Assessment GIS layer.

Table J-15. Summary of R6 Stream Inventory Data for Big Creek and Fish Habitat Standards for Streams.

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**				**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
							Properly Functioning	**At Risk**	**Not Properly Functioning**
Stream Name	**Big Creek Reach 2**	**Big Creek Reach 2**	**Big Creek Reaches 2-10**	**Big Creek Reaches 2-9**	-	-	-	-	-
Pasture Name	Chickenhouse	Chickenhouse	Pizer	Pizer	-	-	-	-	-
Survey Date	2001 (July 17 - Aug 2)	1993 (July 31 – Aug 6)	2001 (July 17 -Aug 2)	1993 (July 31 – Aug 6)	-	-	-	-	-
Sample Type	-	-	-		-	-	-	-	-
6th Field HUC	170702030302	“”	“”	“”	-	-	-	-	-
Av Bankfull (B) and/or Wetted (W) Width (feet)	B 24.4 W 15.7	B 17.8 W 18	B 17.4 W 11.1	B 16.6 W 14.5	-	-	-	-	-
Av Gradient (%)	5	4	5.6	6.5	-	-	-	-	-
Residual Pool Depth (feet)	-	1.4	-	1.4	-	-	-	-	-
Pool Frequency (#/mi)	9.6	22	20	28.8	96[2] 56[3] 47[4] 26[5]	75-132[2] 38-66[3] 30-53[4] 15-26[5]	Meets pool freq & LWD recruitment standards channel width / # pools/mile 5 feet / 184 10 " / 96 15 " / 70 20 " / 56 25 " / 47 50 " / 26	Meets pool freq standards but not LWD recruitment	Does not meet pool freq standards
Pool Quality	No >1m deep pools, max spot	Two >1m deep	No >1m deep	Two >1m deep	-	-	Pools >1m (3.28ft) deep, good cover, cool	Few >1m pools or inadequate	No >1m pools & inadequate

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**				**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
							Properly Functioning	**At Risk**	**Not Properly Functioning**
	temp 62.5F	pools, max spot temp 62.6F	pools, max spot temp 62.5F	pools, max spot temp 62.6F			water, minimal filling	cover/temp, moderate filling	cover/temp, major filling with sediment
Percent Pools	5	7.1	10.8	14.1	-	-	-	-	-
Bankfull (B) or Wetted (W) W/D Ratio	B 20.3 W 19.6	B 9.1 W	B 17.4 W 14.5	B 10.1 W	<10[6]	<10[6]	<10[7]	10-12[7]	>12[7]
D50 (mm), or Dominant Substrate & Embeddedness	140	Gravel. Embeddedness >30% @ 7 of 7 sites	109	Gravel. Embeddedness >30% @ 61 of 62 sites	-	Embedded <=20%	Dominant substrate gravel (2-64 mm) or cobble (64-256 mm) (interstitial spaces clear), or embeddedness <20%	Gravel or cobble subdominant, or embeddedness 20-30% if dominant	Bedrock, sand, silt, or small gravel dominant, or embeddedness >30% if gravel or cobble dominant
Pct Fines <2 mm in Riffles (R) or Pool Tails (P)	R 5.0	-	R 6.6	-	-	-	<12% fines[8] in gravel	12-20% fines[8] in gravel	>20% fines[8] in gravel
Percent Stable Banks (CS & FB)	97% measured on 61% of reach	95	98.8% measured on 21% of reaches	97.8	>80	>90	>90% stable	80-90% stable	< 80% stable
Percent Stable Banks (CS, FB, US)	**-**	**-**	-	**-**	-	-	-	-	-
Percent Undercut Banks	**-**	**-**	-	**-**	>75	50-75% undercut[9]	-	-	-
Large Wood Frequency (#/mi)[14]	26[11], Poor recruitment	16.6[11], Poor recruitment	54.8[11], Good recruitment	55.1[11], Good recruitment	>20[13]	20-70[10] 80-120[11] 100-350[12]	>20[13] and adequate sources for recruitment	>20 but lacks recruitment to maintain	<20 and lacks recruitment

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**				**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
							Properly Functioning	**At Risk**	**Not Properly Functioning**
Percent Shade/Canopy Closure	-	36	-	33	-	40-55[15] 50-65[16] 60-75[17] 80[18]	-	-	-
Greenline Wetland Rating	-	-	-	-	-	-	-	-	-
Greenline Woody Cover	-	-	-	-	-	-	-	-	-
Physical Man-made Barriers[19]	None	None	None	None	-	-	Any in watershed allow passage @ all flows	Any don't allow passage @ base flows	Any don't allow passage @ range of flows
Off-channel Habitat & Refugia	7 side channels total, 9% of reach, AR	-	67 side channels total, 9.6% of reaches, AR	-	-	-	Low energy backwaters & side channels	Some backwaters & high energy side channels	Few or no backwaters

Notes: **1)** All PIBO data units converted from metric to English except for mm measurements; **2)** Channels of <10 feet in width; **3)** Channels of >10 to 20 feet in width; **4)** Channels of >20 to 25 feet in width; **5)** Channels of >25 to 50 feet in width; **6)** Criteria is for wetted W/D ratio; **7)** Criteria is for bankfull W/D ratio; **8)** Fines defined as <0.85mm in gravel; **9)** In non-forested systems with 2% or less gradient; **10)** In Ponderosa pine ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **11)** In mixed conifer ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **12)** In Lodgepole pine ecosystems (at least 6 inches in diameter and 10% > 12 inches in diameter; and at least 18 feet long or 1.5 times bankfull width); **13)** LWD defined as >12 inch diameter and > 35 ft length; **14)** Stream surveys conducted in 1995 and earlier **a)** included not only LW material within the bankfull channel, but also leaning trees that have the potential to fall into the stream, and **b)** included a "Brush" LWD category that is not considered functional LWD as per Amendment 29 DFCs and the MPI unless in Lodgepole Pine ecosystems. Stream surveys conducted in 1996 and later **a)** only included trees actually within the bankfull channel interacting with stream flow during bankfull conditions, and **b)** included a "Small" LWD category that is not considered functional LWD as described above; **15)** In Ponderosa pine ecosystems; **16)** In mixed conifer ecosystems; **17)** In Lodgepole pine ecosystems; **18)** In hardwood/meadow complexes; **19)** Culvert barrier data from MNF Culvert Assessment GIS layer.

Table J-16. Summary of R6 Stream Inventory Data for Deadwood Creek and Fish Habitat Standards for Streams.

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**		**PIBO Data**		**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
							Properly Functioning	**At Risk**	**Not Properly Functioning**
Stream Name	**Deadwood Creek Reaches 1-3**	**Deadwood Creek Reach 1 only (for comparison w/ PIBO)**	**Deadwood Creek Reach 1**	**Deadwood Creek Reach 1**	-	-		-	-
Pasture Name	Pizer	Pizer	Pizer	Pizer	-	-	-	-	-
Survey Date	1993 (Aug 1-5)	1993 (Aug 1-5)	2005	2010	-	-	-	-	-
Sample Type	-	-	I	I	-	-	-	-	-
6th Field HUC	170702030302	""	""	""	-	-	-	-	-
Av Bankfull (B) and/or Wetted (W) Width (feet)	B 12.7 W 9.8	-	-	-	-	-	-	-	-
Av Gradient (%)	8	-	-	-	-	-	-	-	-
Residual Pool Depth (feet)	1.4	1.5	0.79	0.69	-	-	-	-	-
Pool Frequency (#/mi)	30.3	-	-	-	96[2] 56[3] 47[4] 26[5]	75-132[2] 38-66[3] 30-53[4] 15-26[5]	Meets pool freq & LWD recruitment standards channel width # pools/mile 5 feet 184 10 " 96 15 " 70 20 " 56 25 " 47 50 " 26	Meets pool freq standards but not LWD recruitment	Does not meet pool freq standards
Pool Quality	One >1m deep pool, max spot temp 64F	-	-	-	-	-	Pools >1m (3.28ft) deep, good cover, cool water, minimal filling	Few >1m pools or inadequate cover/temp,	No >1m pools & inadequate cover/temp, major

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**		**PIBO Data**		**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
							Properly Functioning	**At Risk**	**Not Properly Functioning**
								moderate filling	filling with sediment
Percent Pools	12.2	22.7	47.6	63.5	-	-	-	-	-
Bankfull (B) or Wetted (W) W/D Ratio	B 7.5	B 8.5	B 23	B 16	<10[6]	<10[6]	<10[7]	10-12[7]	>12[7]
D50 (mm), or Dominant Substrate & Embeddedness	Gravel. Embeddedness >30% @ 45 of 45 sites	Gravel. Embeddedness >30% @ 16 of 16 sites	30	20	-	Embedded <=20%	Dominant substrate gravel (2-64 mm) or cobble (64-256 mm) (interstitial spaces clear), or embeddedness <20%	Gravel or cobble subdominant, or embeddedness 20-30% if dominant	Bedrock, sand, silt, or small gravel dominant, or embeddedness >30% if gravel or cobble dominant
Pct Fines <2 mm in Riffles (R) or Pool Tails (P)	-	-	P 7.1	P 18.0	-	-	<12% fines[8] in gravel	12-20% fines[8] in gravel	>20% fines[8] in gravel
Percent Stable Banks (CS & FB)	84.3	85	100	92	>80	>90	>90% stable	80-90% stable	< 80% stable
Percent Stable Banks (CS, FB, US)	**-**	-	-	-	-	-	-	-	-
Percent Undercut Banks	**-**	-	17.1	47.2	>75	50-75% undercut[9]	-	-	-
Large Wood Frequency (#/mi)[14]	38[11], Fair recruitment	-	-	-	>20[13]	20-70[10] 80-120[11] 100-350[12]	>20[13] and adequate sources for recruitment	>20 but lacks recruitment to maintain	<20 and lacks recruitment
Percent Shade/Canopy Closure	33.7	-	-	-	-	40-55[15] 50-65[16] 60-75[17] 80[18]	-	-	-

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	R6 Level II Stream Survey Data		PIBO Data		PAC FISH RMO	Amend 29 DFC	NMFS Matrix of Pathways and Indicators Ranges of Criteria		
							Properly Functioning	At Risk	Not Properly Functioning
Greenline Wetland Rating	-	-	67	68	-	-	-	-	-
Greenline Woody Cover	-	-	34	39	-	-	-	-	-
Physical Man-made Barriers[19]	3 barrier culverts	-	-	-	-	-	Any in watershed allow passage @ all flows	Any don't allow passage @ base flows	Any don't allow passage @ range of flows
Off-channel Habitat & Refugia	-	-	-	-	-	-	Low energy backwaters & side channels	Some backwaters & high energy side channels	Few or no backwaters

Notes: **1)** All PIBO data units converted from metric to English except for mm measurements; **2)** Channels of <10 feet in width; **3)** Channels of >10 to 20 feet in width; **4)** Channels of >20 to 25 feet in width; **5)** Channels of >25 to 50 feet in width; **6)** Criteria is for wetted W/D ratio; **7)** Criteria is for bankfull W/D ratio; **8)** Fines defined as <0.85mm in gravel; **9)** In non-forested systems with 2% or less gradient; **10)** In Ponderosa pine ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **11)** In mixed conifer ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **12)** In Lodgepole pine ecosystems (at least 6 inches in diameter and 10% > 12 inches in diameter; and at least 18 feet long or 1.5 times bankfull width); **13)** LWD defined as >12 inch diameter and > 35 ft length; **14)** Stream surveys conducted in 1995 and earlier **a)** included not only LW material within the bankfull channel, but also leaning trees that have the potential to fall into the stream, and **b)** included a "Brush" LWD category that is not considered functional LWD as per Amendment 29 DFCs and the MPI unless in Lodgepole Pine ecosystems. Stream surveys conducted in 1996 and later **a)** only included trees actually within the bankfull channel interacting with stream flow during bankfull conditions, and **b)** included a "Small" LWD category that is not considered functional LWD as described above; **15)** In Ponderosa pine ecosystems; **16)** In mixed conifer ecosystems; **17)** In Lodgepole pine ecosystems; **18)** In hardwood/meadow complexes; **19)** Culvert barrier data from MNF Culvert Assessment GIS layer.

Table J-17. Summary of R6 Stream Inventory Data for Elk, North Fork Elk, Deep, and Mosquito Creeks, and Fish Habitat Standards for Streams.

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**				**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
							Properly Functioning	**At Risk**	**Not Properly Functioning**
Stream Name	**Elk Creek Reaches 1-2**	**NF Elk Creek Reach 1**	**Deep Creek Reaches 1-2**	**Mosquito Creek Reach 1**	-	-	-	-	-
Pasture Name	Susanville	Susanville	Susanville	Mosquito Riparian	-	-	-	-	-
Survey Date	1992 (July 22-29)	1992 (Aug 3-5)	1992 (July 13-24)	1992 (Aug 3-5)	-	-	-	-	-
Sample Type	-	-	-	-	-	-	-	-	-
6th Field HUC	170702030301	""	""	""	-	-	-	-	-
Av Bankfull (B) and/or Wetted (W) Width (feet)	B 9.5 W 5.1	B 11.2 W 4.2	B 7.9 W 3.6	B 9.2 W 2.8	-	-	-	-	-
Av Gradient (%)	4	8	8	6	-	-	-	-	-
Residual Pool Depth (feet)	0.7	0.6	0.6	0.5	-	-	-	-	-
Pool Frequency (#/mi)	109.1	134.7	64.6	128.6	96[2] 56[3] 47[4] 26[5]	75-132[2] 38-66[3] 30-53[4] 15-26[5]	Meets pool freq & LWD recruitment standards channel width / # pools/mile 5 feet 184 10 " 96 15 " 70 20 " 56 25 " 47 50 " 26	Meets pool freq standards but not LWD recruitment	Does not meet pool freq standards
Pool Quality	No >1m deep pools, max spot temp	No >1m deep pools,	Four >1m deep pools,	No >1m deep pools,	-	-	Pools >1m (3.28ft) deep, good cover, cool water, minimal filling	Few >1m pools or inadequate cover/temp,	No >1m pools & inadequate cover/temp, major

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**				**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
							Properly Functioning	**At Risk**	**Not Properly Functioning**
	66.2F	max spot temp 66.2F	max spot temp 64.4F	max spot temp 60.8F				moderate filling	filling with sediment
Percent Pools	37.6	27.0	15.4	36.6	-	-	-	-	-
Bankfull (B) or Wetted (W) W/D Ratio	B 7.0	B 8.6	B 6.1	B 9.5	<10[6]	<10[6]	<10[7]	10-12[7]	>12[7]
D50 (mm), or Dominant Substrate & Embeddedness	Cobble, Embeddedness >35%	Cobble, Embeddedness >35%	Sand, Embeddedness >35%	Sand, Embeddedness >35%	-	Embedded <=20%	Dominant substrate gravel (2-64 mm) or cobble (64-256 mm) (interstitial spaces clear), or embeddedness <20%	Gravel or cobble subdominant, or embeddedness 20-30% if dominant	Bedrock, sand, silt, or small gravel dominant, or embeddedness >30% if gravel or cobble dominant
Pct Fines <2 mm in Riffles (R) or Pool Tails (P)	-	-	-	-	-	-	<12% fines[8] in gravel	12-20% fines[8] in gravel	>20% fines[8] in gravel
Percent Stable Banks (CS & FB)	99.5	100.0	100	95	>80	>90	>90% stable	80-90% stable	< 80% stable
Percent Stable Banks (CS, FB, US)	-	-	-	-	-	-	-	-	-
Percent Undercut Banks	-	-	-	-	>75	50-75% undercut[9]	-	-	-
Large Wood Frequency (#/mi)[14]	110.1[11], Poor Recruitment	170.2[11], Poor Recruitment	172.4[11], Poor Recruitment	199.8[11], Poor Recruitment	>20[13]	20-70[10] 80-120[11] 100-350[12]	>20[13] and adequate sources for recruitment	>20 but lacks recruitment to maintain	<20 and lacks recruitment

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**				**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
							Properly Functioning	**At Risk**	**Not Properly Functioning**
Percent Shade/Canopy Closure	59	67	68.0	Over 60	-	40-55[15] 50-65[16] 60-75[17] 80[18]	-	-	-
Greenline Wetland Rating	-	-	-	-	-	-	-	-	-
Greenline Woody Cover	-	-	-	-	-	-	-	-	-
Physical Man-made Barriers[19]	One barrier culvert	2 barrier culverts	2 barrier culverts on FS, one barrier culvert on private prop	One barrier culvert (private)	-	-	Any in watershed allow passage @ all flows	Any don't allow passage @ base flows	Any don't allow passage @ range of flows
Off-channel Habitat & Refugia	Side channels on 13.2% of reaches	Side channels on 6.5% of reaches	Side channels on 1.1% of reaches	3.7% side channels	-	-	Low energy backwaters & side channels	Some backwaters & high energy side channels	Few or no backwaters

Notes: **1)** All PIBO data units converted from metric to English except for mm measurements; **2)** Channels of <10 feet in width; **3)** Channels of >10 to 20 feet in width; **4)** Channels of >20 to 25 feet in width; **5)** Channels of >25 to 50 feet in width; **6)** Criteria is for wetted W/D ratio; **7)** Criteria is for bankfull W/D ratio; **8)** Fines defined as <0.85mm in gravel; **9)** In non-forested systems with 2% or less gradient; **10)** In Ponderosa pine ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **11)** In mixed conifer ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **12)** In Lodgepole pine ecosystems (at least 6 inches in diameter and 10% > 12 inches in diameter; and at least 18 feet long or 1.5 times bankfull width); **13)** LWD defined as >12 inch diameter and > 35 ft length; **14)** Stream surveys conducted in 1995 and earlier **a)** included not only LW material within the bankfull channel, but also leaning trees that have the potential to fall into the stream, and **b)** included a "Brush" LWD category that is not considered functional LWD as per Amendment 29 DFCs and the MPI unless in Lodgepole Pine ecosystems. Stream surveys conducted in 1996 and later **a)** only included trees actually within the bankfull channel interacting with stream flow during bankfull conditions, and **b)** included a "Small" LWD category that is not considered functional LWD as described above; **15)** In Ponderosa pine ecosystems; **16)** In mixed conifer ecosystems; **17)** In Lodgepole pine ecosystems; **18)** In hardwood/meadow complexes; **19)** Culvert barrier data from MNF Culvert Assessment GIS layer.

Table J-18. Summary of R6 Stream Inventory Data for Granite Boulder and Lemon Creeks, and Fish Habitat Standards for Streams.

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**				**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
							Properly Functioning	**At Risk**	**Not Properly Functioning**
Stream Name	**Granite Boulder Creek Reaches 3-4**	**Granite Boulder Cr Reaches 1-2**	**Lemon Creek Reach 1**	**Lemon Creek Reach 1**	-	-	-	-	-
Pasture Name	Granite Boulder	Granite Boulder	Granite Boulder	Granite Boulder	-	-	-	-	-
Survey Date	2001 (July 31 – Aug 6)	1993 (Aug 8 – 10)	2001 (Aug 20)	1993 (Aug 8 – 9)	-	-	-	-	-
Sample Type	-	-	-	-	-	-	-	-	-
6th Field HUC	170702030203	“”	17070203 0203	“”	-	-	-	-	-
Av Bankfull (B) and/or Wetted (W) Width (feet)	B 18.4 W 12.9	B 18.9 W 15.1	B 7.9 W 4.9	B 6.2 W 4.4	-	-	-	-	-
Av Gradient (%)	6.5	6.5	15	16	-	-	-	-	-
Residual Pool Depth (feet)	-	1.5	-	0.8	-	-	-	-	-
Pool Frequency (#/mi)	13.3	32.5	9.8	36	96[2] 56[3] 47[4] 26[5]	75-132[2] 38-66[3] 30-53[4] 15-26[5]	Meets pool freq & LWD recruitment standards channel width / # pools/mile 5 feet 184 10 " 96 15 " 70 20 " 56 25 " 47 50 " 26	Meets pool freq standards but not LWD recruitment	Does not meet pool freq standards

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**				**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
							Properly Functioning	**At Risk**	**Not Properly Functioning**
Pool Quality	One >1m deep pool, max spot temp 63.9F	One >1m deep pool, max spot temp 59.0F	No >1m deep pools, max spot temp 59.9F	No >1m deep pools, max spot temp 52.0F			Pools >1m (3.28ft) deep, good cover, cool water, minimal filling	Few >1m pools or inadequate cover/temp, moderate filling	No >1m pools & inadequate cover/temp, major filling with sediment
Percent Pools	5.5	8.8	2	6.3	-	-	-	-	-
Bankfull (B) or Wetted (W) W/D Ratio	B 14.7 W 9.9	B 9.9	B 13.2 W 8.3	B 2.8	<10[6]	<10[6]	<10[7]	10-12[7]	>12[7]
D50 (mm), or Dominant Substrate & Embeddedness	129.8	Cobble. Embeddedness >30% @ 31 of 31 sites	60.4, Embedded	Sand. Embeddedness >30% @ 26 of 26 sites	-	Embedded <=20%	Dominant substrate gravel (2-64 mm) or cobble (64-256 mm) (interstitial spaces clear), or embeddedness <20%	Gravel or cobble subdominant, or embeddedness 20-30% if dominant	Bedrock, sand, silt, or small gravel dominant, or embeddedness >30% if gravel or cobble dominant
Pct Fines <2 mm in Riffles (R) or Pool Tails (P)	R 3.0	-	R 11	-	-	-	<12% fines[8] in gravel	12-20% fines[8] in gravel	>20% fines[8] in gravel
Percent Stable Banks (CS & FB)	98 (measured on 23% of reaches)	96	93% measured on 72% of reach	99	>80	>90	>90% stable	80-90% stable	< 80% stable
Percent Stable Banks (CS, FB, US)	-	-	-	-	-	-	-	-	-
Percent Undercut Banks	-	-	-	-	>75	50-75% undercut[9]	-	-	-

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**				**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
							Properly Functioning	**At Risk**	**Not Properly Functioning**
Large Wood Frequency (#/mi)[14]	55.5[11], good recruitment	45[11], good recruitment	46[11], Good Recruitment	39.6[11]	>20[13]	20-70[10] 80-120[11] 100-350[12]	>20[13] and adequate sources for recruitment	>20 but lacks recruitment to maintain	<20 and lacks recruitment
Percent Shade/Canopy Closure	-	36.7	¾ of reach burned in 1996, void of shading vegetation	58	-	40-55[15] 50-65[16] 60-75[17] 80[18]	-	-	-
Greenline Wetland Rating	-	-	-	-	-	-	-	-	-
Greenline Woody Cover	-	-	-	-	-	-	-	-	-
Physical Man-made Barriers[19]	One barrier culvert	One barrier culvert	None	None	-	-	Any in watershed allow passage @ all flows	Any don't allow passage @ base flows	Any don't allow passage @ range of flows
Off-channel Habitat & Refugia	Side channels on 27% of reaches	-	Side channels on 0% of reaches	Side channels on 0% of reaches	-	-	Low energy backwaters & side channels	Some backwaters & high energy side channels	Few or no backwaters

Notes: **1)** All PIBO data units converted from metric to English except for mm measurements; **2)** Channels of <10 feet in width; **3)** Channels of >10 to 20 feet in width; **4)** Channels of >20 to 25 feet in width; **5)** Channels of >25 to 50 feet in width; **6)** Criteria is for wetted W/D ratio; **7)** Criteria is for bankfull W/D ratio; **8)** Fines defined as <0.85mm in gravel; **9)** In non-forested systems with 2% or less gradient; **10)** In Ponderosa pine ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **11)** In mixed conifer ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **12)** In Lodgepole pine ecosystems (at least 6 inches in diameter and 10% > 12 inches in diameter; and at least 18 feet long or 1.5 times bankfull width); **13)** LWD defined as >12 inch diameter and > 35 ft length; **14)** Stream surveys conducted in 1995 and earlier **a)** included not only LW material within the bankfull channel, but also leaning trees that have the potential to fall into the stream, and **b)** included a "Brush" LWD category that is not considered functional LWD as per Amendment 29 DFCs and the MPI unless in Lodgepole Pine ecosystems. Stream surveys conducted in 1996 and later **a)** only included trees actually within the bankfull channel interacting with stream flow during bankfull conditions, and **b)** included a "Small" LWD category that is not considered functional LWD as described above; **15)** In Ponderosa pine ecosystems; **16)** In mixed conifer ecosystems; **17)** In Lodgepole pine ecosystems; **18)** In hardwood/meadow complexes; **19)** Culvert barrier data from MNF Culvert Assessment GIS layer.

Table J-19. Summary of R6 Stream Inventory Data for Myrtle and Coyote Creeks, and Fish Habitat Standards for Streams.

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**			**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
						Properly Functioning	**At Risk**	**Not Properly Functioning**
Stream Name	**Myrtle Creek Reaches 1-3**	**Myrtle Creek Reaches 1-3**	**Coyote Creek Reach 2**	-	-	-	-	-
Pasture Name	Susanville	Susanville	Susanville	-	-	-	-	-
Survey Date	2001 (Aug 4-9)	1992 (July 21-24)	1992 (Aug 5-12)	-	-	-	-	-
Sample Type	-	-	-	-	-	-	-	-
6th Field HUC	170702030204	""	170702030208	-	-	-	-	-
Av Bankfull (B) and/or Wetted (W) Width (feet)	B 7.1 W 5.4	B 9.4 W 5.8	B W 1.7	-	-	-	-	-
Av Gradient (%)	6.7	10.3	8	-	-	-	-	-
Residual Pool Depth (feet)	-	0.8	0.5	-	-	-	-	-
Pool Frequency (#/mi)	19.8	168.3	62.8	96[2] 56[3] 47[4] 26[5]	75-132[2] 38-66[3] 30-53[4] 15-26[5]	Meets pool freq & LWD recruitment standards channel width / # pools/mile 5 feet 184 10 " 96 15 " 70 20 " 56 25 " 47 50 " 26	Meets pool freq standards but not LWD recruitment	Does not meet pool freq standards
Pool Quality	No >1m deep pools, max spot temp 69.8F	No >1m deep pools, max spot	No >1m deep pools, max spot temp 64.4F			Pools >1m (3.28ft) deep, good cover, cool water, minimal filling	Few >1m pools or inadequate cover/temp,	No >1m pools & inadequate cover/temp, major

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**			**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
						Properly Functioning	**At Risk**	**Not Properly Functioning**
		temp 57.2F					moderate filling	filling with sediment
Percent Pools	3.7	21.3	4.9	-	-	-	-	-
Bankfull (B) or Wetted (W) W/D Ratio	B 12.1 W 10.9	B 10.7	B 7.7	<10[6]	<10[6]	<10[7]	10-12[7]	>12[7]
D50 (mm), or Dominant Substrate & Embeddedness	32.3, Embedded	Sand. Embeddedness >35%	Sand, Embeddedness >35%	-	Embedded <=20%	Dominant substrate gravel (2-64 mm) or cobble (64-256 mm) (interstitial spaces clear), or embeddedness <20%	Gravel or cobble subdominant, or embeddedness 20-30% if dominant	Bedrock, sand, silt, or small gravel dominant, or embeddedness >30% if gravel or cobble dominant
Pct Fines <2 mm in Riffles (R) or Pool Tails (P)	R 23.3	-	-	-	-	<12% fines[8] in gravel	12-20% fines[8] in gravel	>20% fines[8] in gravel
Percent Stable Banks (CS & FB)	96.7% measured on 21% of reaches	95.6	100	>80	>90	>90% stable	80-90% stable	< 80% stable
Percent Stable Banks (CS, FB, US)	-	-	-	-	-	-	-	-
Percent Undercut Banks	-	-	-	>75	50-75% undercut[9]	-	-	-
Large Wood Frequency (#/mi)[14]	54[11], Good Recruitment	20.7[11], Good Recruitment	258.3[11], Poor Recruitment	>20[13]	20-70[10] 80-120[11] 100-350[12]	>20[13] and adequate sources for recruitment	>20 but lacks recruitment to maintain	<20 and lacks recruitment
Percent Shade/Canopy Closure	Burned in 1996, no overstory shading,	72.4	64	-	40-55[15] 50-65[16] 60-75[17]	-	-	-

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**			**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
						Properly Functioning	**At Risk**	**Not Properly Functioning**
	understory developing				80[18]			
Greenline Wetland Rating	-	-	-	-	-	-	-	-
Greenline Woody Cover	-	-	-	-	-	-	-	-
Physical Man-made Barriers[19]	2 barrier culverts	2 barrier culverts	1 culvert barrier (on private)	-	-	Any in watershed allow passage @ all flows	Any don't allow passage @ base flows	Any don't allow passage @ range of flows
Off-channel Habitat & Refugia	Side channels on 2.5% of reaches, 8 total	Side channels on 4.1% of reaches	Side channels on 4.6% of reaches	-	-	Low energy backwaters & side channels	Some backwaters & high energy side channels	Few or no backwaters

Notes: **1)** All PIBO data units converted from metric to English except for mm measurements; **2)** Channels of <10 feet in width; **3)** Channels of >10 to 20 feet in width; **4)** Channels of >20 to 25 feet in width; **5)** Channels of >25 to 50 feet in width; **6)** Criteria is for wetted W/D ratio; **7)** Criteria is for bankfull W/D ratio; **8)** Fines defined as <0.85mm in gravel; **9)** In non-forested systems with 2% or less gradient; **10)** In Ponderosa pine ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **11)** In mixed conifer ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **12)** In Lodgepole pine ecosystems (at least 6 inches in diameter and 10% > 12 inches in diameter; and at least 18 feet long or 1.5 times bankfull width); **13)** LWD defined as >12 inch diameter and > 35 ft length; **14)** Stream surveys conducted in 1995 and earlier **a)** included not only LW material within the bankfull channel, but also leaning trees that have the potential to fall into the stream, and **b)** included a "Brush" LWD category that is not considered functional LWD as per Amendment 29 DFCs and the MPI unless in Lodgepole Pine ecosystems. Stream surveys conducted in 1996 and later **a)** only included trees actually within the bankfull channel interacting with stream flow during bankfull conditions, and **b)** included a "Small" LWD category that is not considered functional LWD as described above; **15)** In Ponderosa pine ecosystems; **16)** In mixed conifer ecosystems; **17)** In Lodgepole pine ecosystems; **18)** In hardwood/meadow complexes; **19)** Culvert barrier data from MNF Culvert Assessment GIS layer.

Table J-20. Summary of R6 Stream Inventory Data for Onion and Swamp Gulches, and Fish Habitat Standards for Streams.

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**		**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
					Properly Functioning	**At Risk**	**Not Properly Functioning**
Stream Name	**Onion Gulch Reach 1**	**Swamp Gulch Reaches 1-2**	-	-	-	-	-
Pasture Name	Pizer	Pizer	-	-	-	-	-
Survey Date	1993 (Aug 2-3)	1993 (Aug 2-4)	-	-	-	-	-
Sample Type	-	-	-	-	-	-	-
6th Field HUC	170702030302	""	-	-	-	-	-
Av Bankfull (B) and/or Wetted (W) Width (feet)	B 3.8 W 3.4	B 8.6 W 6.1	-	-	-	-	-
Av Gradient (%)	6	12	-	-	-	-	-
Residual Pool Depth (feet)	0.8	1.1	-	-	-	-	-
Pool Frequency (#/mi)	26	45.5	96[2] 56[3] 47[4] 26[5]	75-132[2] 38-66[3] 30-53[4] 15-26[5]	Meets pool freq & LWD recruitment standards channel width / # pools/mile 5 feet 184 10 " 96 15 " 70 20 " 56 25 " 47 50 " 26	Meets pool freq standards but not LWD recruitment	Does not meet pool freq standards
Pool Quality	No >1m deep pools, max spot temp 69F	No >1m deep pools, max spot temp 57F	-	-	Pools >1m (3.28ft) deep, good cover, cool water, minimal filling	Few >1m pools or inadequate cover/temp, moderate filling	No >1m pools & inadequate cover/temp, major filling with sediment
Percent Pools	11	16	-	-	-	-	-

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**		**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
					Properly Functioning	**At Risk**	**Not Properly Functioning**
Bankfull (B) or Wetted (W) W/D Ratio	B 5.5	B 4.4	<10[6]	<10[6]	<10[7]	10-12[7]	>12[7]
D50 (mm), or Dominant Substrate & Embeddedness	Sand. Embeddedness >30% @ 24 of 24 sites	Sand. Embeddedness >30% @ 18 of 18 sites	-	Embedded <=20%	Dominant substrate gravel (2-64 mm) or cobble (64-256 mm) (interstitial spaces clear), or embeddedness <20%	Gravel or cobble subdominant, or embeddedness 20-30% if dominant	Bedrock, sand, silt, or small gravel dominant, or embeddedness >30% if gravel or cobble dominant
Pct Fines <2 mm in Riffles (R) or Pool Tails (P)	-	-	-	-	<12% fines[8] in gravel	12-20% fines[8] in gravel	>20% fines[8] in gravel
Percent Stable Banks (CS & FB)	87	97	>80	>90	>90% stable	80-90% stable	< 80% stable
Percent Stable Banks (CS, FB, US)	**-**	-	-	-	-	-	-
Percent Undercut Banks	**-**	-	>75	50-75% undercut[9]	-	-	-
Large Wood Frequency (#/mi)[14]	13.8[11]	65.1[11], Fair recruitment	>20[13]	20-70[10] 80-120[11] 100-350[12]	>20[13] and adequate sources for recruitment	>20 but lacks recruitment to maintain	<20 and lacks recruitment
Percent Shade/Canopy Closure	25	56	-	40-55[15] 50-65[16] 60-75[17] 80[18]	-	-	-
Greenline Wetland Rating	-	-	-	-	-	-	-

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	R6 Level II Stream Survey Data		PAC FISH RMO	Amend 29 DFC	NMFS Matrix of Pathways and Indicators Ranges of Criteria		
					Properly Functioning	**At Risk**	**Not Properly Functioning**
Greenline Woody Cover	-	-	-	-	-	-	-
Physical Man-made Barriers[19]	None	One barrier culvert	-	-	Any in watershed allow passage @ all flows	Any don't allow passage @ base flows	Any don't allow passage @ range of flows
Off-channel Habitat & Refugia	-	-	-	-	Low energy backwaters & side channels	Some backwaters & high energy side channels	Few or no backwaters

Notes: **1)** All PIBO data units converted from metric to English except for mm measurements; **2)** Channels of <10 feet in width; **3)** Channels of >10 to 20 feet in width; **4)** Channels of >20 to 25 feet in width; **5)** Channels of >25 to 50 feet in width; **6)** Criteria is for wetted W/D ratio; **7)** Criteria is for bankfull W/D ratio; **8)** Fines defined as <0.85mm in gravel; **9)** In non-forested systems with 2% or less gradient; **10)** In Ponderosa pine ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **11)** In mixed conifer ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **12)** In Lodgepole pine ecosystems (at least 6 inches in diameter and 10% > 12 inches in diameter; and at least 18 feet long or 1.5 times bankfull width); **13)** LWD defined as >12 inch diameter and > 35 ft length; **14)** Stream surveys conducted in 1995 and earlier **a)** included not only LW material within the bankfull channel, but also leaning trees that have the potential to fall into the stream, and **b)** included a "Brush" LWD category that is not considered functional LWD as per Amendment 29 DFCs and the MPI unless in Lodgepole Pine ecosystems. Stream surveys conducted in 1996 and later **a)** only included trees actually within the bankfull channel interacting with stream flow during bankfull conditions, and **b)** included a "Small" LWD category that is not considered functional LWD as described above; **15)** In Ponderosa pine ecosystems; **16)** In mixed conifer ecosystems; **17)** In Lodgepole pine ecosystems; **18)** In hardwood/meadow complexes; **19)** Culvert barrier data from MNF Culvert Assessment GIS layer.

Table J-21. Summary of R6 Stream Inventory Data for Pizer, Lost, and East Fork Big Creeks, and Fish Habitat Standards for Streams.

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**			**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
						Properly Functioning	**At Risk**	**Not Properly Functioning**
Stream Name	**Pizer Creek Reach 1**	**Lost Creek Reach 1**	**East Fork Big Creek Reach 1**	-	-	-	-	-
Pasture Name	Pizer	Pizer	Pizer	-	-	-	-	-
Survey Date	1993 (July 30)	1993 (July 30-31)	1993 (Aug 1-2)	-	-	-	-	-
Sample Type	-	-	-	-	-	-	-	-
6th Field HUC	170702030302	""	""	-	-	-	-	-
Av Bankfull (B) and/or Wetted (W) Width (feet)	B 8.4 W 5.6	B 5.2 W 3.8	B 7.5 W 5.9	-	-	-	-	-
Av Gradient (%)	8	8	7	-	-	-	-	-
Residual Pool Depth (feet)	0.8	0.8	0.8	-	-	-	-	-
Pool Frequency (#/mi)	41.4	24.5	11.7	96[2] 56[3] 47[4] 26[5]	75-132[2] 38-66[3] 30-53[4] 15-26[5]	Meets pool freq & LWD recruitment standards channel width / # pools/mile 5 feet / 184 10 " / 96 15 " / 70 20 " / 56 25 " / 47 50 " / 26	Meets pool freq standards but not LWD recruitment	Does not meet pool freq standards
Pool Quality	No >1m deep pools, max spot temp 61F	No >1m deep pools, max spot temp 59F	No >1m deep pools, max spot temp 56F	-	-	Pools >1m (3.28ft) deep, good cover, cool water, minimal filling	Few >1m pools or inadequate cover/temp, moderate filling	No >1m pools & inadequate cover/temp, major filling with sediment
Percent Pools	7.7	4.8	4.5	-	-	-	-	-

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**			**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
						Properly Functioning	**At Risk**	**Not Properly Functioning**
Bankfull (B) or Wetted (W) W/D Ratio	B 10.2	B 6.4	B 7.2	<10[6]	<10[6]	<10[7]	10-12[7]	>12[7]
D50 (mm), or Dominant Substrate & Embeddedness	Gravel. Embeddedness >30% @ 8 of 9 sites	Sand. Embeddedness >30% @ 23 of 23 sites	Sand. Embeddedness >30% @ 27 of 27 sites	-	Embedded <=20%	Dominant substrate gravel (2-64 mm) or cobble (64-256 mm) (interstitial spaces clear), or embeddedness <20%	Gravel or cobble subdominant, or embeddedness 20-30% if dominant	Bedrock, sand, silt, or small gravel dominant, or embeddedness >30% if gravel or cobble dominant
Pct Fines <2 mm in Riffles (R) or Pool Tails (P)	-	-	-	-	-	<12% fines[8] in gravel	12-20% fines[8] in gravel	>20% fines[8] in gravel
Percent Stable Banks (CS & FB)	95	92	95	>80	>90	>90% stable	80-90% stable	< 80% stable
Percent Stable Banks (CS, FB, US)	-	-	-	-	-	-	-	-
Percent Undercut Banks	-	-	-	>75	50-75% undercut[9]	-	-	-
Large Wood Frequency (#/mi)[14]	58.1[11], Good recruitment	45.5[11], Good recruitment	34.5[11], Good recruitment	>20[13]	20-70[10] 80-120[11] 100-350[12]	>20[13] and adequate sources for recruitment	>20 but lacks recruitment to maintain	<20 and lacks recruitment
Percent Shade/Canopy Closure	66	52	58	-	40-55[15] 50-65[16] 60-75[17] 80[18]	-	-	-
Greenline Wetland Rating	-	-	-	-	-	-	-	-

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	R6 Level II Stream Survey Data			PAC FISH RMO	Amend 29 DFC	NMFS Matrix of Pathways and Indicators Ranges of Criteria		
						Properly Functioning	**At Risk**	**Not Properly Functioning**
Greenline Woody Cover	-	-	-	-	-	-	-	-
Physical Man-made Barriers[19]	One barrier culvert	3 barrier culverts	4 barrier culverts	-	-	Any in watershed allow passage @ all flows	Any don't allow passage @ base flows	Any don't allow passage @ range of flows
Off-channel Habitat & Refugia	Many streamside wetlands	Many streamside wetlands & sidechannels	Many streamside wetlands	-	-	Low energy backwaters & side channels	Some backwaters & high energy side channels	Few or no backwaters

Notes: **1)** All PIBO data units converted from metric to English except for mm measurements; **2)** Channels of <10 feet in width; **3)** Channels of >10 to 20 feet in width; **4)** Channels of >20 to 25 feet in width; **5)** Channels of >25 to 50 feet in width; **6)** Criteria is for wetted W/D ratio; **7)** Criteria is for bankfull W/D ratio; **8)** Fines defined as <0.85mm in gravel; **9)** In non-forested systems with 2% or less gradient; **10)** In Ponderosa pine ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **11)** In mixed conifer ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **12)** In Lodgepole pine ecosystems (at least 6 inches in diameter and 10% > 12 inches in diameter; and at least 18 feet long or 1.5 times bankfull width); **13)** LWD defined as >12 inch diameter and > 35 ft length; **14)** Stream surveys conducted in 1995 and earlier **a)** included not only LW material within the bankfull channel, but also leaning trees that have the potential to fall into the stream, and **b)** included a "Brush" LWD category that is not considered functional LWD as per Amendment 29 DFCs and the MPI unless in Lodgepole Pine ecosystems. Stream surveys conducted in 1996 and later **a)** only included trees actually within the bankfull channel interacting with stream flow during bankfull conditions, and **b)** included a "Small" LWD category that is not considered functional LWD as described above; **15)** In Ponderosa pine ecosystems; **16)** In mixed conifer ecosystems; **17)** In Lodgepole pine ecosystems; **18)** In hardwood/meadow complexes; **19)** Culvert barrier data from MNF Culvert Assessment GIS layer.

Slide Creek Allotment

Tables J-22 through J-25 present data for streams in the Lower Middle Fork Allotment.

Table J-22. Summary of R6 Stream Inventory Data for Camp and Lick Creeks, and Fish Habitat Standards for Streams.

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	R6 Level II Stream Survey Data				PAC FISH RMO	Amend 29 DFC	NMFS Matrix of Pathways and Indicators Ranges of Criteria		
							Properly Functioning	**At Risk**	**Not Properly Functioning**
Stream Name	**Camp Creek**	**Camp**	**Lick Creek**	**Lick**	-	-	-	-	-

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**				**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
							Properly Functioning	**At Risk**	**Not Properly Functioning**
	Reaches 3-4	**Creek Reach 3**	**Reach 1**	**Creek Reach 1**					
Pasture Name	Camp Cr Riparian	Camp Cr Riparian	Camp Cr Riparian	Camp Cr Riparian	-	-	-	-	-
Survey Date	2004 (Aug 3-Sept 10)	1994 (June 29-July 26)	2004 (Aug 21 – Sept 11)	1994 (June 30-July 8)	-	-	-	-	-
Sample Type	**-**	**-**	-	**-**	-	-	-	-	-
6th Field HUC	1707020302 07	“”	“”	“”	-	-	-	-	-
Av Bankfull (B) and/or Wetted (W) Width (feet)	B 29.5 W 14.6	B 29.2 W 18.7	B 15.6 W 9.2	B 14.7 W 9.6	-	-	-	-	-
Av Gradient (%)	2.1	2.0	2.4	3.0	-	-	-	-	-
Residual Pool Depth (feet)	1.6	1.2	1.3	1.1	-	-	-	-	-
Pool Frequency (#/mi)	17.5	23.0	32.0	39.3	96[2] 56[3] 47[4] 26[5]	75-132[2] 38-66[3] 30-53[4] 15-26[5]	Meets pool freq & LWD recruitment standards channel width / # pools/mile 5 feet 184 10 " 96 15 " 70 20 " 56 25 " 47 50 " 26	Meets pool freq standards but not LWD recruitment	Does not meet pool freq standards

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**				**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
							Properly Functioning	**At Risk**	**Not Properly Functioning**
Pool Quality	No >1m deep pools, max spot temp 72.0F	No >1m deep pools, max spot temp 78.0F	No >1m deep pools, max spot temp 73.0F	No >1m deep pools, max spot temp 66.2F	-	-	Pools >1m (3.28ft) deep, good cover, cool water, minimal filling	Few >1m pools or inadequate cover/temp, moderate filling	No >1m pools & inadequate cover/temp, major filling with sediment
Percent Pools	15.0	24.1	17.0	20.4	-	-	-	-	-
Bankfull (B) or Wetted (W) W/D Ratio	B 32.8 W 26.3	B 21.2	B 23.0 W 29.8	B 14.3	<10[6]	<10[6]	<10[7]	10-12[7]	>12[7]
D50 (mm), or Dominant Substrate & Embeddedness	111.1	Cobble, Embeddedness not >30%	44.0	Cobble, Embeddedness >30%	-	Embedded <=20%	Dominant substrate gravel (2-64 mm) or cobble (64-256 mm) (interstitial spaces clear), or embeddedness <20%	Gravel or cobble subdominant, or embeddedness 20-30% if dominant	Bedrock, sand, silt, or small gravel dominant, or embeddedness >30% if gravel or cobble dominant
Pct Fines <2 mm in Riffles (R) or Pool Tails (P)	R 4.0	-	R 12	-	-	-	<12% fines[8] in gravel	12-20% fines[8] in gravel	>20% fines[8] in gravel
Percent Stable Banks (CS & FB)	98.0 measured on 90 percent of reaches	99.0	99.3 measured on 99% of reach	99.7	>80	>90	>90% stable	80-90% stable	< 80% stable
Percent Stable Banks (CS, FB, US)	-	-	-	-	-	-	-	-	-
Percent Undercut Banks	-	-	-	-	>75	50-75% undercut[9]	-	-	-

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**				**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
							Properly Functioning	**At Risk**	**Not Properly Functioning**
Large Wood Frequency (#/mi)[14]	7.0[10], fair recruitment	13.7[10]	8.0[10]	17.9[10]	>20[13]	20-70[10] 80-120[11] 100-350[12]	>20[13] and adequate sources for recruitment	>20 but lacks recruitment to maintain	<20 and lacks recruitment
Percent Shade/Canopy Closure	34.7	18.0	67.7	45.2	-	40-55[15] 50-65[16] 60-75[17] 80[18]	-	-	-
Greenline Wetland Rating	-	-	-	-	-	-	-	-	-
Greenline Woody Cover	-	-	-	-	-	-	-	-	-
Physical Man-made Barriers[19]	Numerous log weirs that may restrict juveniles	Numerous log weirs that may restrict juveniles	Numerous log weirs that may restrict juveniles	Numerous log weirs that may restrict juveniles	-	-	Any in watershed allow passage @ all flows	Any don't allow passage @ base flows	Any don't allow passage @ range of flows
Off-channel Habitat & Refugia	Side channels on 5.0 percent of reaches	-	Side channels on 2 percent of reach	-	-	-	Low energy backwaters & side channels	Some backwaters & high energy side channels	Few or no backwaters

Notes: **1)** All PIBO data units converted from metric to English except for mm measurements; **2)** Channels of <10 feet in width; **3)** Channels of >10 to 20 feet in width; **4)** Channels of >20 to 25 feet in width; **5)** Channels of >25 to 50 feet in width; **6)** Criteria is for wetted W/D ratio; **7)** Criteria is for bankfull W/D ratio; **8)** Fines defined as <0.85mm in gravel; **9)** In non-forested systems with 2% or less gradient; **10)** In Ponderosa pine ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **11)** In mixed conifer ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **12)** In Lodgepole pine ecosystems (at least 6 inches in diameter and 10% > 12 inches in diameter; and at least 18 feet long or 1.5 times bankfull width); **13)** LWD defined as >12 inch diameter and > 35 ft length; **14)** Stream surveys conducted in 1995 and earlier **a)** included not only LW material within the bankfull channel, but also leaning trees that have the potential to fall into the stream, and **b)** included a "Brush" LWD category that is not considered functional LWD as per Amendment 29 DFCs and the MPI unless in Lodgepole Pine ecosystems. Stream surveys conducted in 1996 and later **a)** only included trees actually within the bankfull channel interacting with stream flow during bankfull conditions, and **b)** included a "Small" LWD category that is not considered functional LWD as described above; **15)** In Ponderosa pine ecosystems; **16)** In mixed conifer ecosystems; **17)** In Lodgepole pine ecosystems; **18)** In hardwood/meadow complexes; **19)** Culvert barrier data from MNF Culvert Assessment GIS layer.

Table J-23. Summary of PIBO Effectiveness Monitoring Data for Slide Creek and Fish Habitat Standards for Streams.

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**PIBO Effectiveness Monitoring Data**		**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
					Properly Functioning	**At Risk**	**Not Properly Functioning**
Stream Name	**Slide Creek Reach 1**	**Slide Creek Reach 1**	-	-	-	-	-
Pasture Name	York Pasture, York Allotment, approx. 1.25 miles downstream from Slide Riparian Pasture	York Pasture, York Allotment, approx. 1.25 miles downstream from Slide Riparian Pasture	-	-	-	-	-
Survey Date	2005	2010	-	-	-	-	-
Sample Type	I	I	-	-	-	-	-
6th Field HUC	170702030304	""	-	-	-	-	-
Av Bankfull (B) and/or Wetted (W) Width (feet)	-	-	-	-	-	-	-
Av Gradient (%)	-	-	-	-	-	-	-
Residual Pool Depth (feet)	0.52	0.52	-	-	-	-	-
Pool Frequency (#/mi)	-	-	96[2] 56[3] 47[4] 26[5]	75-132[2] 38-66[3] 30-53[4] 15-26[5]	Meets pool freq & LWD recruitment standards channel width / # pools/mile 5 feet 184 10 " 96 15 " 70 20 " 56 25 " 47 50 " 26	Meets pool freq standards but not LWD recruitment	Does not meet pool freq standards
Pool Quality	-	-	-	-	Pools >1m (3.28ft) deep, good cover, cool water, minimal filling	Few >1m pools or inadequate cover/temp, moderate filling	No >1m pools & inadequate cover/temp, major filling with sediment

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**PIBO Effectiveness Monitoring Data**		**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
					Properly Functioning	**At Risk**	**Not Properly Functioning**
Percent Pools	53.1	44.6	-	-	-	-	-
Bankfull (B) or Wetted (W) W/D Ratio	B 12	B 8	<10[6]	<10[6]	<10[7]	10-12[7]	>12[7]
D50 (mm), or Dominant Substrate & Embeddedness	60	50	-	Embedded <=20%	Dominant substrate gravel (2-64 mm) or cobble (64-256 mm) (interstitial spaces clear), or embeddedness <20%	Gravel or cobble subdominant, or embeddedness 20-30% if dominant	Bedrock, sand, silt, or small gravel dominant, or embeddedness >30% if gravel or cobble dominant
Pct Fines <2 mm in Riffles (R) or Pool Tails (P)	P 31.9	P 6.9	-	-	<12% fines[8] in gravel	12-20% fines[8] in gravel	>20% fines[8] in gravel
Percent Stable Banks (CS & FB)	98	98	>80	>90	>90% stable	80-90% stable	< 80% stable
Percent Stable Banks (CS, FB, US)	-	-	-	-	-	-	-
Percent Undercut Banks	12.8	33.3	>75	50-75% undercut[9]	-	-	-
Large Wood Frequency (#/mi)[14]	-	-	>20[13]	20-70[10] 80-120[11] 100-350[12]	>20[13] and adequate sources for recruitment	>20 but lacks recruitment to maintain	<20 and lacks recruitment
Percent Shade/Canopy Closure	-	-	-	40-55[15] 50-65[16] 60-75[17] 80[18]	-	-	-

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**PIBO Effectiveness Monitoring Data**		**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
					Properly Functioning	**At Risk**	**Not Properly Functioning**
Greenline Wetland Rating	57	61	-	-	-	-	-
Greenline Woody Cover	77	55	-	-	-	-	-
Physical Man-made Barriers[19]	-	-	-	-	Any in watershed allow passage @ all flows	Any don't allow passage @ base flows	Any don't allow passage @ range of flows
Off-channel Habitat & Refugia	-	-	-	-	Low energy backwaters & side channels	Some backwaters & high energy side channels	Few or no backwaters

Notes: **1)** All PIBO data units converted from metric to English except for mm measurements; **2)** Channels of <10 feet in width; **3)** Channels of >10 to 20 feet in width; **4)** Channels of >20 to 25 feet in width; **5)** Channels of >25 to 50 feet in width; **6)** Criteria is for wetted W/D ratio; **7)** Criteria is for bankfull W/D ratio; **8)** Fines defined as <0.85mm in gravel; **9)** In non-forested systems with 2% or less gradient; **10)** In Ponderosa pine ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **11)** In mixed conifer ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **12)** In Lodgepole pine ecosystems (at least 6 inches in diameter and 10% > 12 inches in diameter; and at least 18 feet long or 1.5 times bankfull width); **13)** LWD defined as >12 inch diameter and > 35 ft length; **14)** Stream surveys conducted in 1995 and earlier **a)** included not only LW material within the bankfull channel, but also leaning trees that have the potential to fall into the stream, and **b)** included a "Brush" LWD category that is not considered functional LWD as per Amendment 29 DFCs and the MPI unless in Lodgepole Pine ecosystems. Stream surveys conducted in 1996 and later **a)** only included trees actually within the bankfull channel interacting with stream flow during bankfull conditions, and **b)** included a "Small" LWD category that is not considered functional LWD as described above; **15)** In Ponderosa pine ecosystems; **16)** In mixed conifer ecosystems; **17)** In Lodgepole pine ecosystems; **18)** In hardwood/meadow complexes; **19)** Culvert barrier data from MNF Culvert Assessment GIS layer.

Table J-24. Summary of R6 Stream Inventory Data for Slide Creek and Fish Habitat Standards for Streams.

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**		**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
					Properly Functioning	**At Risk**	**Not Properly Functioning**
Stream Name	**Slide Creek Reaches 1-2**	**Slide Creek Reaches 2-3**	-	-	-	-	-

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**		**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
					Properly Functioning	**At Risk**	**Not Properly Functioning**
Pasture Name	Slide Riparian	West Pasture	-	-	-	-	-
Survey Date	1992 (Aug 12-15)	1992 (Aug 12-15)	-	-	-	-	-
Sample Type	-	-	-	-	-	-	-
6th Field HUC	170702030304	""	-	-	-	-	-
Av Bankfull (B) and/or Wetted (W) Width (feet)	W 4.8	W 4.3	-	-	-	-	-
Av Gradient (%)	5.0	5.0	-	-	-	-	-
Residual Pool Depth (feet)	0.6	0.5	-	-	-	-	-
Pool Frequency (#/mi)	102.9	84.3	96[2] 56[3] 47[4] 26[5]	75-132[2] 38-66[3] 30-53[4] 15-26[5]	Meets pool freq & LWD recruitment standards channel width # pools/mile 5 feet 184 10 " 96 15 " 70 20 " 56 25 " 47 50 " 26	Meets pool freq standards but not LWD recruitment	Does not meet pool freq standards
Pool Quality	No >1m deep pools, max spot temp 77.0F	No >1m deep pools, max spot temp 71.6F	-	-	Pools >1m (3.28ft) deep, good cover, cool water, minimal filling	Few >1m pools or inadequate cover/temp, moderate filling	No >1m pools & inadequate cover/temp, major filling with sediment
Percent Pools	32.6	17.0	-	-	-	-	-
Bankfull (B) or Wetted (W) W/D Ratio	B 11.3	B 11.7	<10[6]	<10[6]	<10[7]	10-12[7]	>12[7]

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**		**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
					Properly Functioning	**At Risk**	**Not Properly Functioning**
D50 (mm), or Dominant Substrate & Embeddedness	Cobble, Embeddedness not >35%	Cobble, Embeddedness not >35%	-	Embedded <=20%	Dominant substrate gravel (2-64 mm) or cobble (64-256 mm) (interstitial spaces clear), or embeddedness <20%	Gravel or cobble subdominant, or embeddedness 20-30% if dominant	Bedrock, sand, silt, or small gravel dominant, or embeddedness >30% if gravel or cobble dominant
Pct Fines <2 mm in Riffles (R) or Pool Tails (P)	-	-	-	-	<12% fines[8] in gravel	12-20% fines[8] in gravel	>20% fines[8] in gravel
Percent Stable Banks (CS & FB)	85.5	90.5	>80	>90	>90% stable	80-90% stable	< 80% stable
Percent Stable Banks (CS, FB, US)	**-**	**-**	-	-	-	-	-
Percent Undercut Banks	**-**	**-**	>75	50-75% undercut[9]	-	-	-
Large Wood Frequency (#/mi)[14]	130.5[11], Poor Recruitment	282.2[11], Poor Recruitment	>20[13]	20-70[10] 80-120[11] 100-350[12]	>20[13] and adequate sources for recruitment	>20 but lacks recruitment to maintain	<20 and lacks recruitment
Percent Shade/Canopy Closure	37.5	52.5	-	40-55[15] 50-65[16] 60-75[17] 80[18]	-	-	-
Greenline Wetland Rating	-	-	-	-	-	-	-
Greenline Woody Cover	-	-	-	-	-	-	-
Physical Man-made Barriers[19]	None	1 culvert barrier	-	-	Any in watershed allow passage @ all flows	Any don't allow passage @ base flows	Any don't allow passage @ range of flows

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	R6 Level II Stream Survey Data		PAC FISH RMO	Amend 29 DFC	NMFS Matrix of Pathways and Indicators Ranges of Criteria		
					Properly Functioning	**At Risk**	**Not Properly Functioning**
Off-channel Habitat & Refugia	Side channels on 4.3% of reaches	Side channels on 5.4% of reaches	-	-	Low energy backwaters & side channels	Some backwaters & high energy side channels	Few or no backwaters

Notes: **1)** All PIBO data units converted from metric to English except for mm measurements; **2)** Channels of <10 feet in width; **3)** Channels of >10 to 20 feet in width; **4)** Channels of >20 to 25 feet in width; **5)** Channels of >25 to 50 feet in width; **6)** Criteria is for wetted W/D ratio; **7)** Criteria is for bankfull W/D ratio; **8)** Fines defined as <0.85mm in gravel; **9)** In non-forested systems with 2% or less gradient; **10)** In Ponderosa pine ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **11)** In mixed conifer ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **12)** In Lodgepole pine ecosystems (at least 6 inches in diameter and 10% > 12 inches in diameter; and at least 18 feet long or 1.5 times bankfull width); **13)** LWD defined as >12 inch diameter and > 35 ft length; **14)** Stream surveys conducted in 1995 and earlier **a)** included not only LW material within the bankfull channel, but also leaning trees that have the potential to fall into the stream, and **b)** included a "Brush" LWD category that is not considered functional LWD as per Amendment 29 DFCs and the MPI unless in Lodgepole Pine ecosystems. Stream surveys conducted in 1996 and later **a)** only included trees actually within the bankfull channel interacting with stream flow during bankfull conditions, and **b)** included a "Small" LWD category that is not considered functional LWD as described above; **15)** In Ponderosa pine ecosystems; **16)** In mixed conifer ecosystems; **17)** In Lodgepole pine ecosystems; **18)** In hardwood/meadow complexes; **19)** Culvert barrier data from MNF Culvert Assessment GIS layer.

Table J-25. Summary of R6 Stream Inventory Data for Whiskey and Bear Creeks, and Fish Habitat Standards for Streams.

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	R6 Level II Stream Survey Data			PAC FISH RMO	Amend 29 DFC	NMFS Matrix of Pathways and Indicators Ranges of Criteria		
						Properly Functioning	**At Risk**	**Not Properly Functioning**
Stream Name	**Whiskey Creek Reach 1**	**Whiskey Creek Reach 2**	**Bear Creek Reaches 1-3**	-	-	-	-	-
Pasture Name	Whiskey Riparian	East	East	-	-	-	-	-
Survey Date	1994 (June 22-24)	1994 (June 22-24)	1993 (July 4-7)	-	-	-	-	-
Sample Type	**-**	**-**	-	-	-	-	-	-
6th Field HUC	170702030207	""	170702030301	-	-	-	-	-

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**			**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
						Properly Functioning	**At Risk**	**Not Properly Functioning**
Av Bankfull (B) and/or Wetted (W) Width (feet)	B 9.3 W 4.5	B 8.7 W 3.4	B 14.7 W 4.6	-	-	-	-	-
Av Gradient (%)	6	11	5.0	-	-	-	-	-
Residual Pool Depth (feet)	0.7	0.5	0.8	-	-	-	-	-
Pool Frequency (#/mi)	68.3	64.0	26.6	96[2] 56[3] 47[4] 26[5]	75-132[2] 38-66[3] 30-53[4] 15-26[5]	Meets pool freq & LWD recruitment standards channel width # pools/mile 5 feet 184 10 " 96 15 " 70 20 " 56 25 " 47 50 " 26	Meets pool freq standards but not LWD recruitment	Does not meet pool freq standards
Pool Quality	One >1m deep pool, max spot temp 76.2F	No >1m deep pools, max spot temp 62.6F	No >1m deep pools, max spot temp 55.0F		-	Pools >1m (3.28ft) deep, good cover, cool water, minimal filling	Few >1m pools or inadequate cover/temp, moderate filling	No >1m pools & inadequate cover/temp, major filling with sediment
Percent Pools	12.3	11.6	7.2	-	-	-	-	-
Bankfull (B) or Wetted (W) W/D Ratio	B 10.5	B 10.6	B 9.7	<10[6]	<10[6]	<10[7]	10-12[7]	>12[7]
D50 (mm), or Dominant Substrate & Embeddedness	Cobble, Embeddedness >30%	Cobble, Embeddedness not >30%	Gravel, Embeddedness >30% @ 23 of 23 sites	-	Embedded <=20%	Dominant substrate gravel (2-64 mm) or cobble (64-256 mm) (interstitial spaces clear), or embeddedness <20%	Gravel or cobble subdominant, or embeddedness 20-30% if dominant	Bedrock, sand, silt, or small gravel dominant, or embeddedness >30% if gravel or cobble dominant

PIBO Data[1] (Bold) *R6 Survey Protocol (Italics)* ***Both (Bold & Italics)***	**R6 Level II Stream Survey Data**			**PAC FISH RMO**	**Amend 29 DFC**	**NMFS Matrix of Pathways and Indicators Ranges of Criteria**		
						Properly Functioning	**At Risk**	**Not Properly Functioning**
Pct Fines <2 mm in Riffles (R) or Pool Tails (P)	-	-	-	-	-	<12% fines[8] in gravel	12-20% fines[8] in gravel	>20% fines[8] in gravel
Percent Stable Banks (CS & FB)	98.6	96.1	86.0	>80	>90	>90% stable	80-90% stable	< 80% stable
Percent Stable Banks (CS, FB, US)	-	-	-	-	-	-	-	-
Percent Undercut Banks	-	-	-	>75	50-75% undercut[9]	-	-	-
Large Wood Frequency (#/mi)[14]	24.6[11]	29.8[11]	64.8[11]	>20[13]	20-70[10] 80-120[11] 100-350[12]	>20[13] and adequate sources for recruitment	>20 but lacks recruitment to maintain	<20 and lacks recruitment
Percent Shade/Canopy Closure	31.0	32.4	62.0	-	40-55[15] 50-65[16] 60-75[17] 80[18]	-	-	-
Greenline Wetland Rating	-	-	-	-	-	-	-	-
Greenline Woody Cover	-	-	-	-	-	-	-	-
Physical Man-made Barriers[19]	None	One barrier culvert	None	-	-	Any in watershed allow passage @ all flows	Any don't allow passage @ base flows	Any don't allow passage @ range of flows
Off-channel Habitat & Refugia	-	-	-	-	-	Low energy backwaters & side channels	Some backwaters & high energy side channels	Few or no backwaters

Notes: **1)** All PIBO data units converted from metric to English except for mm measurements; **2)** Channels of <10 feet in width; **3)** Channels of >10 to 20 feet in width; **4)** Channels of >20 to 25 feet in width; **5)** Channels of >25 to 50 feet in width; **6)** Criteria is for wetted W/D ratio; **7)** Criteria is for bankfull W/D ratio; **8)** Fines defined as <0.85mm in gravel; **9)** In non-forested systems with 2% or less gradient; **10)** In Ponderosa pine ecosystems (at least 12

inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **11)** In mixed conifer ecosystems (at least 12 inches in diameter and 20% > 20 inches in diameter; and at least 35 feet long or 1.5 times bankfull width); **12)** In Lodgepole pine ecosystems (at least 6 inches in diameter and 10% > 12 inches in diameter; and at least 18 feet long or 1.5 times bankfull width); **13)** LWD defined as >12 inch diameter and > 35 ft length; **14)** Stream surveys conducted in 1995 and earlier **a)** included not only LW material within the bankfull channel, but also leaning trees that have the potential to fall into the stream, and **b)** included a "Brush" LWD category that is not considered functional LWD as per Amendment 29 DFCs and the MPI unless in Lodgepole Pine ecosystems. Stream surveys conducted in 1996 and later **a)** only included trees actually within the bankfull channel interacting with stream flow during bankfull conditions, and **b)** included a "Small" LWD category that is not considered functional LWD as described above; **15)** In Ponderosa pine ecosystems; **16)** In mixed conifer ecosystems; **17)** In Lodgepole pine ecosystems; **18)** In hardwood/meadow complexes; **19)** Culvert barrier data from MNF Culvert Assessment GIS layer.